1909.

CITY AND COUNTY OF BRISTOL.

ANNUAL REPORT

OF THE

Medical Officer of Health,

AND OF THE

General Medical Superintendent of the City Hospitals.

SPECIAL REPORT ON SMALLPOX.

SPECIAL REPORT ON TYPHOID FEVER.

Printed by order of the Health Committee.

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HEALTH COMMITTEE.

1909.

The Right Honourable The Lord Mayor:

CHRISTOPHER ALBERT HAYES, ESQ.

Chairman:

Councillor COLSTON WINTLE., M.R.C.S.

Deputy Chairman:

Councillor FRANK MOORE.

Alderman TERRETT.

Councillor JOB AMES

„ HENRY ANSTEY.
(Chairman of Finance Sub-Committee).

„ H. F. DEVIS, M.R.C.S.

„ A. DOWLING.

„ E. M. DYER.

Councillor A. E. ELLERY.

„ A. FROUD.

„ H. J. MAGGS.

„ W. G. POPE.

„ J. S. G. W. STROUD.

„ C. J. THORNE.

CITY OF BRISTOL.

HEALTH DEPARTMENT, 1909.

Medical Officer of Health: D. S. DAVIES, M.D., D.P.H.

Chief Inspector: J. W. KIRLEY.

Superintendent Inspector: ‡*T. LOWTHER.

District Inspectors (11):

	District.		District.
G. E. BUSH	(Bedminster)	*†A. E. KING	(Knowle)
*H. HASELL	(Horfield)	*†H. C. LEAT	(Stapleton)
*J. WILKINSON	(Clifton)	*†T. J. CROFTS	(Easton)
*H. J. KIRLEY	(Cotham)	*F. KIRLEY	(S. George E.)
*J. T. LYONS	(S. Geo. W.)	*G. BEST	(Bedminster)
*†F. R. SLADE	(S. Paul)		

Inspector of Common Lodging Houses and Bakehouses:

*S. O. DIMOND.

Inspector of Dairies, Cowsheds, and Milkshops:

*†E. J. CASELY.

Inspectors of Slaughter Houses, Meat, and Fish:

S. THOMAS. | *A. GITSHAM.

Inspectors of Workshops, &c.:

*†A. W. GRIFFITHS. | *W. J. WREFORD.

Chief Clerk: L. W. A. STATTON.

Statistical Clerk: W. N. BROWN.

Clerks:

C. W. M. VINCENT, L. P. WILSON, E. E. MASTERS, J. G. WATSON.

CITY HOSPITALS.

General Medical Superintendent: (Supervisory) D. S. DAVIES, M.D., D.P.H

Visiting Medical Officer at Novers Hill Hospital:

G. C. PAULI, M.R.C.S.

Resident Medical Officer at Ham Green Hospital:

J. FLETCHER, M.D., D.P.H.

PORT OF BRISTOL.

Port Medical Officer of Health:

D. S. DAVIES, M.D., D.P.H.

Assistant Port M.O.H.: J. C. HEAVEN, M.R.C.S., D.P.H.

Chief Port Inspector: S. O. DIMOND.

Port Inspector: A. DICKENS.

Assistant Port Inspector and Boatman: J. REX.

Master of S.S. "Luath": §G. JACKSON.

‡ Surveyor's Certificate, Sanitary Institute.
* Inspector's Certificate, Sanitary Institute.
† Registered Plumber.
§ Certificated Pilot for Bristol Channel.

My Lord Mayor and Gentlemen,

In the early months of the year under review (1909), an introduction of virulent Small-pox offered chance to the City of heavy loss in life and money; happily met and averted by the staff with a devotion which did not altogether escape toll.

Now that the laws of the life-history of disease are known not to march in line with the mischances affecting drains, the space devoted to observation and research on the habits of some diseases as noted in the City may be appreciated, and this may prove instructive as well as reminiscent. More opportunity for pathological research is needed in most Sanitary Districts.

The year has disclosed some needs and emphasised some deficiencies, as will be gathered from the context.

I am, my Lord Mayor and Gentlemen,

Your obedient Servant,

D. S. DAVIES, M.D.

Medical Officer of Health.

Health Department,

Bristol, May, 1910.

REPORT.

PART I.

Population and Acreage.

The estimated population of the City at the middle of 1909 was 377,642 persons, upon an area of 17,289 acres.

Table A. **

Showing Population, Acreage, and number of Persons per Acre (Density) in each of the Registration Sub-Districts of Bristol for 1891 compared with the same data for 1909.

Registration Sub-Districts, 1891. (Census Year)	Acreage	Population middle of 1891.	Density, 1891.	Registration Sub-District, 1909.		†Acreage.	Population middle of 1909.	Density 1909.
S. Mary Redcliff ...	170	9,287	54·6	S. Mary Redcliff (Including Castle Precincts, and part of S. Paul).	‖ Bristol Central.	810	38,165	47·1
Castle Precincts ...	119	5,558	46·7					
S. Paul	148	19,046	128·6					
S. James	68	7,817	114·9	‡S. Paul and S. Augustine				
S. Augustine ...	250	13,788	55·1					
Bedminster ...	992	45,812	46·1	Bedminster, Knowle, etc. ... (Including Somerset added area.)		1,924 1,184	89,297	28·7
Clifton	921	29,361	31·8	Clifton		1,504	44,573	29·6
Ashley	434	24,190	55·7	Ashley		1,365	47,702	34·9
Westbury	692	15,540	22·4					
				S. George		1,846	71,501	38·7
S. Philip	744	51,650	69·6	S. Philip		736	47,999	65·2
				Stapleton		2,573	26,961	10·4
				Westbury-on-Trym (Including the whole of Avonmouth, Shirehampton, Westbury-on-Trym, and part of Henbury, added to City from Barton Regis Rural District, 1st October, 1904.)		5,347	11,444	2·1
Bristol City (1891)	4,538*	222,049	48·93	Bristol City (1909)		17,289	377,642	21·84

* Ordnance calculation, including water areas.

† Census, 1901, and including district added on 1st October, 1904.

‡ The Registrar General of Births, Deaths and Marriages, ordered and declared, that on and after 1st April, 1904, S. Augustine Sub-District shall be united with S. Paul Sub-District, and the enlarged Sub-District so formed, shall be called and known as S. Paul and S. Augustine Sub-District.

‖ The Registrar General of Births, Deaths and Marriages, ordered and declared, that on and after 1st December, 1905, the S. Mary Redcliff Sub-District shall be united with S. Paul and S. Augustine Sub-District, the enlarged Sub-District to be called and known as Bristol Central Sub-District.

** Considerable alterations were again made in the Registration Sub-Districts in April, 1909. (*See next page*).

Changes in Registration Districts and Sub-districts.

Changes in Registration boundaries are made by order of the Registrar General with the consent of the Local Government Board. Those changes which affect the boundaries of Registration Districts are necessitated by changes in the boundaries of Poor Law Unions.

The following summary shows the changes made in the Bristol District, on April 1st, 1909, and is taken from the Quarterly Return of Births and Deaths of the Registrar General, dated 26th July, 1909.

The figures in the present Annual Report are based on the population and areas of the Districts as constituted before this change took place, but in future years all Returns will be based upon the revised figures relating to the newly constituted areas. These will, of course, not be accurately comparable with the figures for the Sub-Registration Districts of previous years.

1909.

1 Apr. (320)—BRISTOL : on this date the Sub-District of Bristol were re-arranged and are now constituted as follows :—

Clifton	1.	Clifton North Ward ..	8,649
		Clifton South Ward ..	8,344
		St. Michael Ward ..	11,769
		St. Augustine Ward ..	17,683
Bristol Central ..	2.	St. Paul Ward	17,966
		St. James Ward ..	11,268
		Central East Ward ..	6,023
		Central West Ward ..	1,726
		Redcliff Ward	8,679
Bedminster ..	3.	Bedminster East Ward	18,739
		Bedminster West Ward	19,406
		Southville Ward ..	18,814
Knowle	4.	Somerset Ward ..	12,645
St. George ..	5.	St. George East Ward ..	20,655

		St. George West Ward ..	21,913
		Easton Ward (part of, viz., No. 2 Polling District)	11,061
St. Philip & Jacob	6.	St. Philip and St. Jacob North Ward	20,466
		St. Philip and St. Jacob South Ward	20,691
		Easton Ward (part of, viz., No. 1 Polling District)	10,068
Stapleton ..	7.	Stapleton Ward ..	21,236
Ashley	8.	Horfield Ward	13,975
		The District Ward ..	18,047
		Redland Ward	9,768
Westbury-on-Trym	9.	Westbury-on-Trym Ward	9,451

GENERAL AND VITAL STATISTICS.

Population.

	Area in Acres	Population (Estimated)	Rateable Value.
City of Bristol, 1897	4,661	232,242	£1,153,311
Additions of 1897	6,756	85,800	£246,815
Additions of 1904	5,347	13,443	£69,560
City of Bristol, 1909	17,004	377,642	£1,841,621

This table shows that the City covers not quite four times the acreage which it covered in 1897, and is more populous by 145,400 persons. The City Medical Officer of Health has inherited the duties and responsibilities of the Medical Officers of Health of this added City; considerable economy has thus been effected in the medical administration, as the salaries of the various medical officers have lapsed.

There is no salaried Assistant Medical Officer to help in either City or Port work, but the occasional Medical Assistance, required in emergency, is paid for by fees for work done. The various extensions have resulted in the displacement of five part-time Medical Officers of Health, whose districts have been absorbed.

The additional work thus devolving on the Medical Officer of Health includes:—

City.—In 1897 the area of the City was increased by 6,756 acres, and the population by 85,800 persons.

In 1904, the area was further increased by an addition of 5,347 acres, and the population by 13,443.

The districts included three Local Board Districts, each in charge of a part-time Medical Officer of Health, and parts of two Rural areas.

Port.—In 1897 responsibility for the Gloucester Port work, under the Cholera, Plague and Yellow Fever Regulations, was imposed by special order upon the Bristol Port Medical Officer of Health.

In 1907, the Public Health (Regulations as to Food) Act imposed all responsibility for the inspection of Imported Food for the whole Port of Bristol upon the Port Medical Officer of Health. This has hitherto been carried out only in Ports under a whole time Port Medical Officer of Health.

No salaries are assigned for any of the above added duties.

Births.

The births registered in Bristol in 1909 were 8,507 of which 296 were returned as illegitimate, a pereentage of 3·4.

The birth rate for the year was 22·5 a decrease on the rate of last year, which was 23·0 ; the rate has since 1882 shown an almost continuous decrease. (Table B). The rate for the 76 great towns in 1909 is 25·7

The excess of births over deaths during the year 1909 (*natural increase of population*) is 3,638. The estimated *actual increase* from 1908 to 1909 is 4,857.

Marriages.

2,670 Marriages took place within the borough of Bristol during 1909. The annual marriage rate per 1,000 living is thus 7·0 compared with 7·5, the rate of last year.

Deaths.

4,869 Deaths were registered in the district during the 52 weeks ending the 1st January, 1910, of which 69 or 1·4 per cent. were returned as deaths of illegitimate children. The recorded general death rate for the year, uncorrected for age and sex distribution is 12·89 per 1,000

living, compared with a rate of 13·76 for the year 1908. The death rate recorded for the 76 great towns in 1909 is 14·7.

The death rate of 12·89 is the lowest death rate ever recorded in the City.

Infant Mortality.

Of the 4,869 Deaths, 860 were of infants under one year. The proportion of these deaths to every 1,000 births (infant mortality) was 101·0, compared with a rate of 125·8 for the year 1908, 100·9 for the year 1907, 127·6 for the year 1906, 122·4 for the year 1905, 133·7 for the year 1904, and 116·3 for 1903. The rate recorded in the 76 great towns is 118.

The Infant Mortality rate varied thus :—

Bristol Central	140·9
S. Philip	105·6
Bedminster	100·8
S. George	99·9
Clifton	97·0
Stapleton	89·6
Westbury-on-Trym	88·2
Ashley	73·4
Knowle	53·3

In Table B. will be seen the annual infantile mortality rates in Bristol for the past 25 years.

The Infantile Death Rate of 101·0 is the lowest rate recorded in the City with the exception of that for 1907 which was 100·9. The Infantile Rates are remarkably low in every Registration Sub-district, with the exception of Bristol Central (Castle Precincts, S. Mary Redcliff, S. Paul, S. James and S. Augustine).

INFANT MORTALITY.

The Health Committee has not yet arranged for the employment of Health Visitors, nor has the Notification of Births Act been adopted.

The Infantile Mortality for the City generally shows ready response to favourable elimatic conditions in any years, as evideneed by the low returns for the equable years 1907 and 1909.

In the central districts, however, even in these years, the Infant Mortality rates are higher than they should be, and the Public Health Authority might well join with private enterprise in distributing adviee and help.

On November 5th, 1909 a Committee of Ladies, comprising Dr. A. Cornall, Mrs. S. H. Badoek, Miss Constance Densham, Miss M. Fry, Miss L. Miles, Miss E. Sturge, Miss Townsend, Mrs. H. C. Trapnell, and Mrs. Mark Whitwill (hon. see).), opened the School for Mothers in the Broad Plain, Bristol ; and Miss Townsend has kindly furnished me with the following report of their work.

Bristol School for Mothers—Held at the Girls' Club House, Broad Plain, St. Philip.

Number of women on the books	61
Average attendanee at the weekly meetings	12
Number of Nursing and Health Leetures given	15
Number of Cookery Lessons, Domestie Seienee Demonstrations, ete. ..	11

Various Demonstration Lessons have also been given on bathing and dressing infants, washing feeding bottles, preparing eradles, washing infants' elothing, making infants' food. Talks have also been given about the "Children's Aet," and various other important subjeets affecting the life and well-being of ehildren.

Dr. Cornall attends every Friday afternoon from 2.30 to 4, sees the women and babies individually, gives adviee *re* infant management, food, ete., and treatment of small

ailments. Where any special course of treatment is required the mothers are advised to take the babies to suitable Institutions.

The members of the School are regularly visited in their own homes by experienced visitors, either a trained Nurse or a lady of experience.

It is too early to judge of the value of the School, but we do see improvement in certain cases. The women take great interest, and some are most intelligent and anxious to learn.

Health Talks given at Mothers' Meetings in the poorer Districts of the City since 1906.

These Talks have been continued each winter since the experimental courses given in the winter of 1906-7, about which a pamphlet was written. The majority of the "Talks" are given by Domestic Science Teachers under the Education Committee; a few special Lectures on Infant Health are given by Dr. Annie Cornall.

The figures are as under :—

Winter.	No. of Meetings to which Teachers were sent.	Talk given. Total.	Individual Women taught
1907–8	38	154	1487
1908–9	27	129	1434
1909–10	23	119	1121

(This session is not yet over, probably a few more lectures may be given).

The number of individual women taught is only approximate, as it is not possible to get all the managers of meetings to send accurate figures.

Courses of six lectures are usually given, in some cases more. Single lectures are occasionally asked for, but I do not consider these of much use. Several meetings have asked for Courses of "Talks" every year, and the managers continue to testify to the usefulness of the instruction given.

(Signed) F. M. TOWNSEND.

Seven Chief Epidemic Diseases. (Zymotics).

The rate of Mortality from the Seven Chief Epidemic Diseases, viz. : Small-pox, Measles, Scarlet Fever, Whooping Cough, Diphtheria, Fever (Typhus, Enteric Fever, and Simple Continued Fever or Pyrexia) and Diarrhœa was in 1909, 0·9 per 1,000 living, compared with a rate of 1·2 in 1908, 0·8 in 1907, 1·6 in 1906, 1905 and 1904, and 1·1 in 1903.

The rate recorded for the 76 great towns in 1909 is 1·4.

The Zymotic rate of 0·9 is the lowest ever recorded in the City, with the exception of that for 1907, which was 0·8.

Annual Rates per 1,000 living. 1909.

	Births	Deaths	Principal Epidemic Diseases. Cols. 4 – 10.	Smallpox	Measles	Scarlet Fever	Diphtheria	Whooping Cough	Fever	Diarrhœa	Deaths under one year to 1,000 Births
Cols. ...	1	2	3	4	5	6	7	8	9	10	11
England and Wales	25·6	14·5	1·12	0·00	0·35	0·09	0·14	0·20	0·06	0·28	109
76 Great Towns	25·7	14·7	1·42	0·00	0·48	0·11	0·15	0·24	0 06	0·38	118
143 Smaller Towns	24·8	13·9	1·08	—	0·33	0 09	0·16	0·17	0·06	0·27	111
England and Wales less the 219 Towns	25·7	14·5	0·80	0·00	0·21	0·06	0·14	0·16	0·06	0·17	98
Bristol	**22·6**	**12·7**	**0·87**	**0·02**	**0·24**	**0·03**	**0·14**	**0·14**	**0·03**	**0·27**	**100**

Mortality at Ages between 5 and 65.

2,116 Deaths were returned, corresponding to an annual rate of mortality per 1,000 living between these ages, of 6·6, compared with a rate of 6·5 in 1908, 7·0 in 1907, 7·1 in 1906, and 7·7 in 1905.

Mortality amongst Aged People.

1,518 Deaths of Persons aged 65 and upwards were registered, whose ages averaged 75 years and 2 months. The rate of mortality per 1,000 amongst persons living at these ages was in Bristol 86·5, compared with 86·2 in 1908, 87·7 in 1907, and 83·8 in 1906.

PREVALENCE OF SICKNESS IN 1909.

Small-pox.

The prevalence and fatality of this disease is here shown for the past 24 years :—

SMALL-POX.

Year.	Cases Notified.	Attacks per 100,000 Living.	Deaths.	Deaths per 100,000 Living.	Case Mortality per cent.
1886	?	?	8	3	?
1887	163	72	13	5	7·9
1888	224	98	26	11	11·6
1889	0	—	0	—	—
1890*	0	—	0	—	—
1891	16	7	1	0·4	6·2
1892	0	—	0	—	—
1893	165	73	20	8	12·1
1894	201	88	16	7	7·9
1895	4	1	0	—	—
1896	42	18	5	2	11·9
1897	10	4	1	0·4	10
1898†	2	0·6	0	—	—
1899	0	—	0	—	—
1900	0	—	0	—	—
1901	1	0·3	0	—	—
1902	4	1	2	0·6	50
1903	46	14	3	0·8	6·5
1904‡	34	9	1	0·2	2·9
1905	13	3	0	—	—
1906	32	8	0	—	—
1907	6§	1·6	1	0·2	16·6
1908	1	0·2	0	—	—
1909	39††	10	9	2	23·0

* Compulsory Notification began. † City Extended.
‡ City again Extended in 1904. § Including one Port case.

†† This total of 39 includes 35 cases in the City actually notified, (one being an Officer of the Cossham Hospital, who lived in the County but formed one of the Cossham group); and there were three abortive cases, and one unrecognised case in the east Bedminster group which were not notified. The unrecognised first case in the Cossham outbreak admitted from the Chipping Sodbury Rural District to Cossham Hospital is not included amongst the City cases.

During these twenty-four years, which constitute my local experience, Small-pox caused a developed outbreak upon two occasions only, viz., in 1887-88 when 387, and in 1893-94 when 366 cases occurred.

Upon both these occasions neither the districts invaded, nor the Hospital accommodation were under one control, and in 1887-88 notification had not become compulsory.

The experience gained in these outbreaks pointed very strongly to the possibility, when dealing with a vaccinated community, of curtailing each commencing ring of extension by strict attention to minutiæ in regard to personal contacts of each freshly introduced case (including their revaccination), and so of destroying the enemy in detail and preventing a general invasion.

A good opportunity of testing this possibility occurred soon after, in 1896, when the notorious epidemic in Gloucester (which yielded 2,000 cases and 400 deaths), afforded frequent introductions to Bristol. The total cases were limited by a strict application of "contact shadowing" to 42, of which 16 occurred in a Common Lodging House, necessitating 3,000 visits.

The difficulty in effective repression of Small-pox is conditioned by the circumstances. Ordinary known introductions by sea or land are readily rendered sterile; but the "missed" case, with its many days' unlimited chances, sets a severe problem.

Between the years 1896 and 1903 the introductions were nearly all by ship, two in 1897 from Ancona and the Black Sea; one in 1898 from Alexandria; one in 1901 from London; four in 1902, three from Maine, U.S.A., and one from Salonica; and were readily controlled.

In 1903 Small-pox was introduced on 15 occasions, twice in January, three times in February, twice in March, three times in April, twice in May, once each in June, July and September. Nine of these introductions proved sterile; the others caused limited outbreaks.

Several introductions also occurred in 1904, and might have proved troublesome amongst the Dockers (some 1,500) engaged on the Royal Edward Dock, had not the Contractors, Sir John Aird & Co., through their Manager and their Works Medical Officer ably seconded our endeavours by providing not only medical supervision, but isolation and observation accommodation. The arrangements worked most smoothly and effectively.

The type of Small-pox observed round the year 1904 was curiously and abnormally mild. Our 34 cases in 1904 yielded only one death, giving a case-rate of 2·9 per cent ; and a similar low rate of mortality was observed in Leicester, where the disease was concurrently prevalent. (727 cases).

The introductions of 1905 and 1906 were similarly of a mild type and of limited infectivity, so that their ready control afforded no indication of the probable success of diligent contact-shadowing (in which the District Inspectors were becoming keenly interested and expert), when applied to an infection of virulent and searching character.

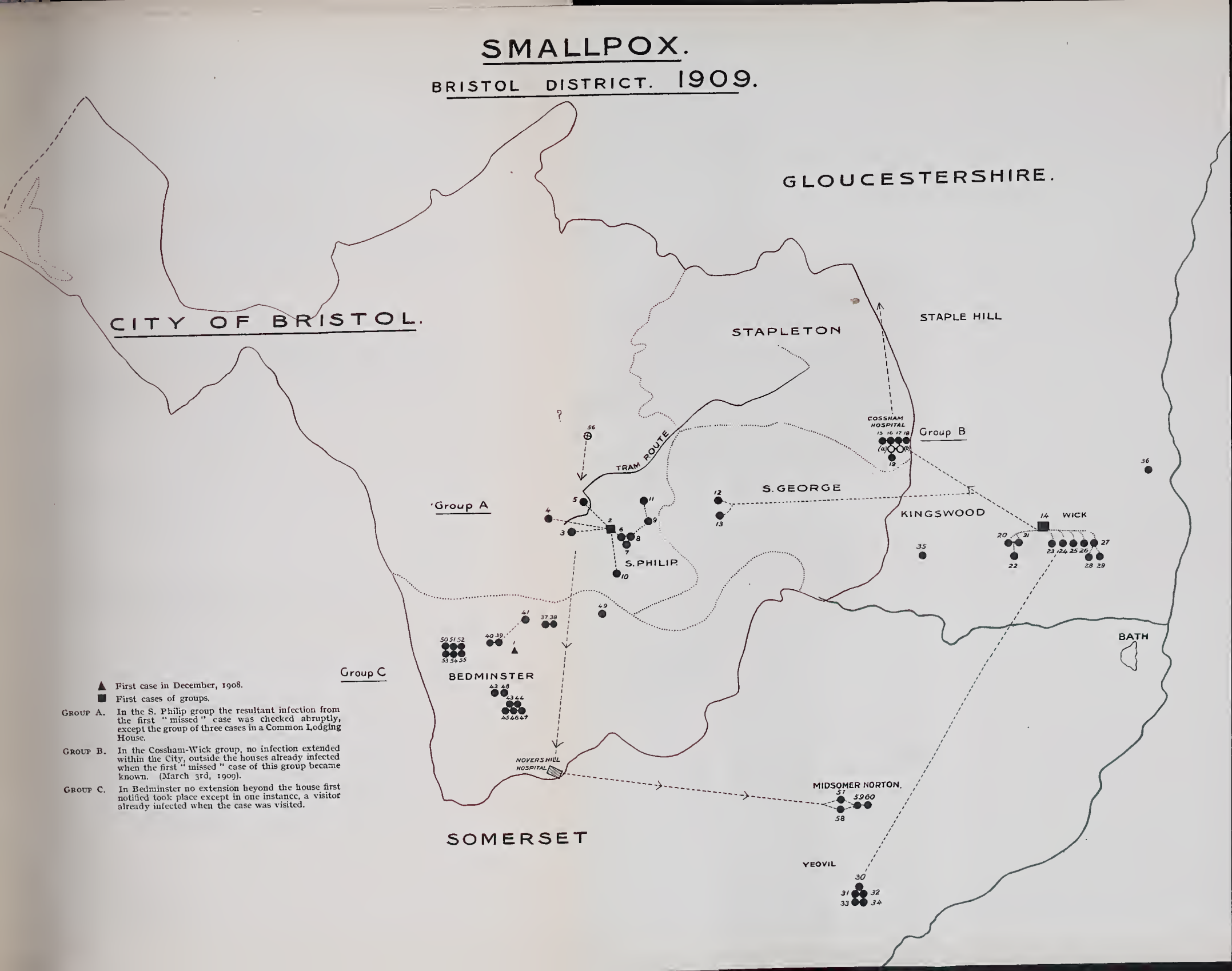
The 1907 introductions were ship-borne, and were readily kept in hand ; but after a year's freedom the introduction of a virulent type of Small-pox and some curious misadventures with unrecognised and missed cases gave opportunity of testing our organisation to the full extent.

SMALL-POX IN BRISTOL DURING 1908-9.

No case of Small-pox occurred in the City during 1908, until December 14th ; in 1909 the disease re-appeared in January, and continued to recur at intervals until the end of May. 39 cases occurred in the City, of which nine died. The City and neighbourhood were free from the disease after May.

SMALLPOX.

BRISTOL DISTRICT. 1909.



▲ First case in December, 1908.

■ First cases of groups.

GROUP A. In the S. Philip group the resultant infection from the first "missed" case was checked abruptly, except the group of three cases in a Common Lodging House.

GROUP B. In the Cossham-Wick group, no infection extended within the City, outside the houses already infected when the first "missed" case of this group became known. (March 3rd, 1909).

GROUP C. In Bedminster no extension beyond the house first notified took place except in one instance, a visitor already infected when the case was visited.

In the adjoining districts two cases occurred in the Warmley Rural District, 11 cases in the Chipping Sodbury Rural District, with one death: five cases at Yeovil with one death: and four cases at Midsomer Norton with one death.

Thus the cases in connection with this outbreak numbered altogether 61, with 12 deaths. Six doubtful cases also came under notice, but proved not to be Small-pox.

The December Case—1908.

On December 14th, 1908, a corn porter, living in Bedminster (1), and at work, within 14 days before sickening, on a steamship discharging grain at Portishead from Mariupol (Sea of Azov), developed a mild attack of Small-pox, was removed to Hospital, and discharged cured on January 23rd, 1909.

No history of illness attached to the ship, but one may reasonably suppose that he contracted infection from some infected article (possibly grain sacks) on board, (the chronic Small-pox Carrier is not known to exist), and if, as seems probable, the subsequent cases in the City had the same origin, through him or through distribution of other infected sacks, the infection thus introduced from the East of Europe was one having potentiality of extreme virulence.

A similarly incomplete but suggestive history of introduction by way of ships from foreign has been obtained on at least two previous occasions; thus, in January, 1907, a first case of Small-pox in the City occurred in a man who worked as a labourer in warehousing ship-brought goods; and in April, 1891, a corn porter working on foreign ships, at a time when the City was free from the disease, sickened with Small-pox, and caused an outbreak. In these instances also no other cases of illness were found on the ships in question.

The January and subsequent cases—1909.

Before the first patient had left Hospital, a labourer living in S. Philip (2), sickened about January 11th, 1909. This man had no known connection with either the ship or the first patient, but the lapse of about a double incubation period (2 × 14=28 days) suggested causation through an intervening "missed" case.

The cases of 1909 readily fall into three fairly defined groups :—(A) The S. Philip Group—round case 2 (see map). (B) The Bedminster Group—somewhat irregular and disconnected. (C) The Cossham Hospital Group—associated with cases occurring in the adjoining Counties of Gloucestershire and Somerset.

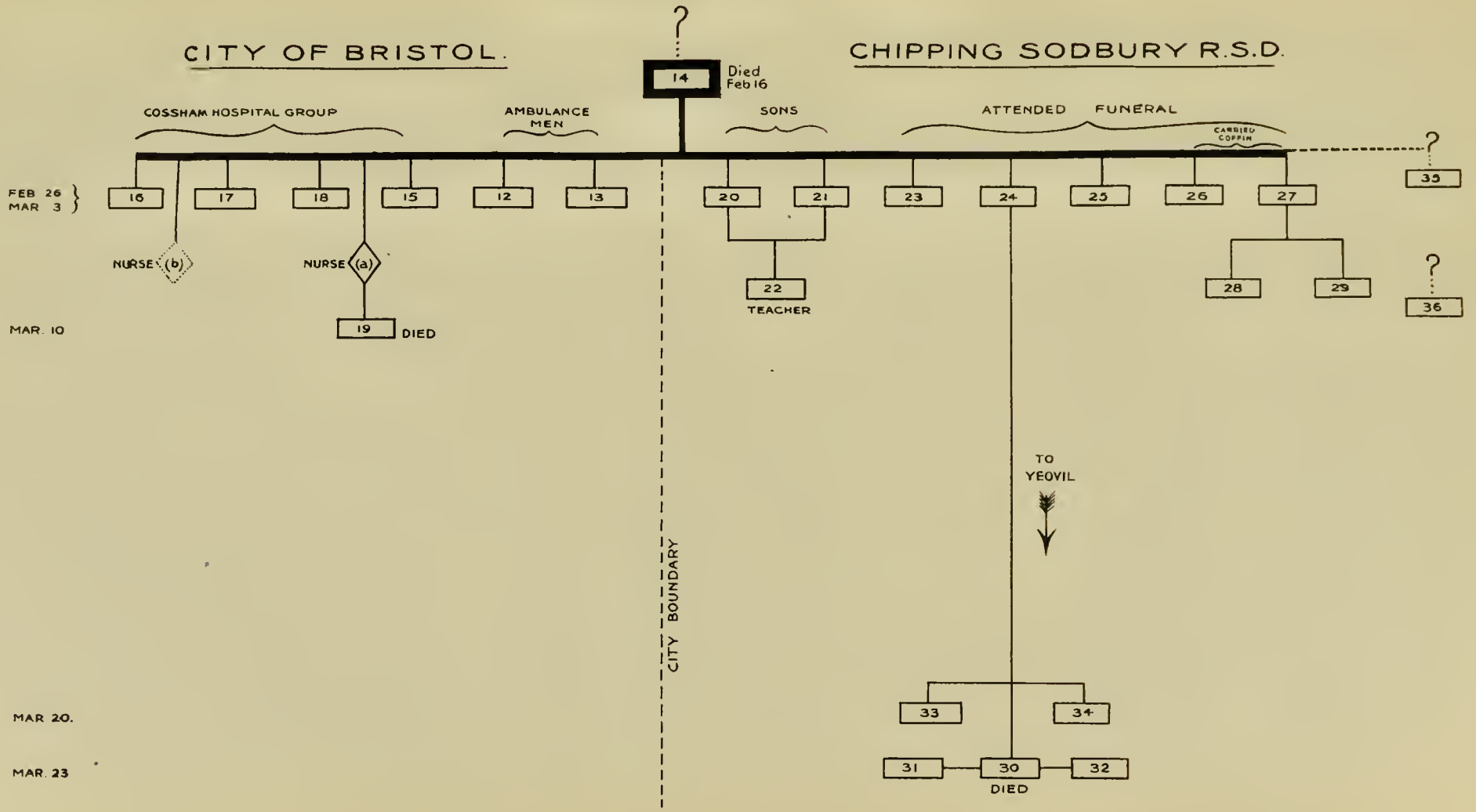
(A). The S. Philip Group (10 cases, 3 deaths).

Case (2). (E.D., 45, m.), unfortunately elected, before the nature of his illness was recognised and notified, to journey by an ordinary tramcar from the Horse Fair, in the centre of the City, to Stapleton, on his way to the Workhouse, a ride of some three miles (see Map), and altogether it was found that, either in the tramcar, at the Relieving Offices, or at work, he had come into contact with 395 known persons, who had to be kept under observation through a full incubation period, and this alone necessitated 5,147 visits of inquiry. Certain other fellow passengers could not be determined, and they may have played some part in subsequent events, especially in the County.

The cases directly traced to this patient, who died, were his daughter-in-law (case 3), a charwoman (case 4), a workman at adjoining premises (5), and a lodger in the same lodging-house (6); case 6 infected two fellow lodgers (7 and 8), who in turn passed it on to a bootmaker friend (9) whose shop was a local gossip-exchange.

SMALLPOX. 1909.

(Group B)



One other case in February, and one in April (cases 10 and 11), complete this group ; the connection could not be traced, but the April case (11) was the wife of a clog-maker, and followed that of the bootmaker (9).

With the exception of the single case in April, the S. Philip group of cases occurred between January 11th and February 27th, and, so closely were these cases "shadowed" that only one (case 6) was able to bear fruit.

(B). The Cossham Hospital Group.

	City	County	Total
Cases	7	18	25
Doubtful Cases ..	2	0	2
Deaths	1	2	3

During the progress of the events recorded above, two men, living in S. George, sickened on the same day, February 27th, and were notified and isolated on 2nd and 3rd March (cases 12—13.) No connection with the previous City cases could be traced, but one was the driver and the other the attendant of a private Assoeiation's Ambulance, intended only for accidents or non-infectious cases. This prompted enquiry as to what cases they had moved on or about February 15th (twelve days before), and the following eircumstances came to light :—

A man—J.S.R. (14)—had sickened about February 12th with *variola nigra* at a village named Wick, about seven miles from Bristol, in the Chipping Sodbury Rural District, Gloucestershire. This case was unfortunately diagnosed as *purpura*, and conveyed by the private ambulance service on February 15th to the Cossham Hospital, a general Hospital just within the extended (1897) boundary of Bristol. The patient died in the isolation ward on February 16th, a *post mortem* was duly made, and the death returned as "acute nephritis." Hence no suspicion was aroused and no precautions taken. The body was returned to Wick for burial.

This case alone infected directly at least fifteen people—eight in the City (including two doubtful cases) —and seven at his home at Wick; indirectly he sooner or later led to 24 cases including two deaths.

On the morning of March 3rd we received information of what was happening at Wick from Dr. Bond, M.O.H. for the District, and this confirmed our suspicions on the information received from the ambulance men. It seemed expedient to visit Cossham Hospital and make enquiries.

Up to the time of our visit the hospital authorities were still unaware of impending danger. The incubation period was already overdue, so it was interesting to learn that two of the Hospital Staff—Mrs. T., a charwoman (15), who cleaned out the isolation ward, and R.B., a clerk (16), whose office adjoined the ward, were at home with "Influenza." They were both promptly visited and removed to Hospital in the papular stage of Small-pox. Later, a kitchenmaid (17), and ward-maid (18), who had been in the isolation ward, also sickened, and were removed to Hospital in the earliest papular stage.

It appeared also, that, towards the end of February, two nurses in attendance on J. S. R. Sister W. and Nurse R. (A. and B.) who had been re-vaccinated in 1908, had developed a train of symptoms—fever, headache, etc., lasting two days, which might do duty either for "Influenza" or for the "initial fever" of Small-pox. No papules followed, they recovered perfectly, and Nurse R. immediately returned to duty in her ward on or about February 28th, 1909. Twelve days afterwards, on March 10th, an unvaccinated patient (19) in her ward developed Small-pox and was removed to the City Hospital where she died; she must have contracted the infection on or about February 28th.

It would appear then, that, with Small-pox, as with Typhoid Fever, attendants on patients may, while their acquired immunity is sufficient to protect them against any material attack of the disease, suffer from slight indisposition, and during that time may exhibit temporary infectivity—become in fact "acute carriers." There is, fortunately, no reason to apprehend the discovery that a certain percentage of cases may become, upon apparent recovery "chronic Small-pox carriers," although the inclusion in a population of such continuously infective persons would do much to lessen the numbers of unvaccinated opponents to vaccination, had not due recognition of the fact and of the risks involved, previously accelerated their conversion.

These seven cases (or nine, counting the two nurses as abortive attacks) all received their infection before March 3rd, and the warning conveyed by the sickening of the ambulance men and by our knowledge of events at Wick, enabled us to search out and promptly isolate each case as it fell. *Apparently not a single case received further infection in the City from this source after March 3rd, when definite knowledge of the circumstances first came to hand.*

Inspector Slade was in special charge of the "contact shadowing" in this district.

At Wick, in the County of Gloucester, the disease had somewhat wider scope. The seven cases directly infected from the original case (J.S.R., 14), included his two sons (20, 21), who subsequently handed on infection to the school teacher (22), two men (26, 27) who carried his coffin, and three others (23, 24, 25), who attended the funeral. One of the men (27) who carried the coffin, transmitted the infection to a fellow workman and his wife (28, 29); another (24), who attended the funeral, went home to Yeovil where he developed Small-pox and

infected five other persons, one fatally, (30, 31, 32, 33, 34). Two sporadic cases also occurred, one in the Chipping Sodbury district, the other in the Warmley district, no doubt causally related, but the line of infection could not be ascertained (35, 36).

It would have been extremely interesting to be able to determine the source of the original case at Wick, but this could not be decided. There were many possibilities.

First—an unknown passenger in the tramcar on January 16th may have contracted the infection from case (2), and himself a "missed" case, handed it on to J.S.R. (14) at Wick; this would account for the 26 days' interval, equal to about two normal incubation periods.

Second—one of those who sickened at Wick after the funeral was the master for whom J.S.R. worked; and to whom had been consigned some of the cargo from the ship connected with the December case in Bristol. So the infection may have been transmitted through infected sacks directly from this ship.

As will be seen later, the first family group of Small-pox in Bedminster occurred amongst relatives of the same mill-owner, and there is room for suspicion that infected articles may have played some part in the distribution of disease; nothing definite could, however, be ascertained.

(C).—The Bedminster Groups (19 cases, 4 deaths).

1. The first group consisted of a daughter and mother (37, 38), who sickened respectively on January 5th and January 16th. The nature of the disease was unsuspected until the mother sickened, but proper nursing and medical attention had been provided from the first and no known extension resulted.

The family were subsequently found to be relatives of a case at Wick, which sickened early in March, but no definite evidence as to infection could be made out.

2. The second group had also an obscure origin, a man engaged in grocery work in many parts of the City developed Small-pox (January 29th) and subsequently infected his daughter and a friend (February 13th), (39, 40, 41).

3. On February 21st, a mild case was found in a girl of 13 (42).

4. A house group of five cases. On March 8th, a man sickened with a mild attack of Small-pox (43), he continued work until the sudden death of his unvaccinated son aged nine (44), of Hæmorrhagic Small-pox on April 2nd, called attention to the family. One other unvaccinated boy of 16 had a discrete attack (45), and two other vaccinated boys of 14 and 12 had marked sickening but very little else (46, 47). The line of causation was unknown, the man was a labourer and occasionally worked at boot-repairing.

5. On March 15th, an unvaccinated child of five months died after a day or two's illness, apparently of Hæmorrhagic Small-pox (48), she lived in a house close to case C. 3 (42).

6. On April 5th, the wife of a painter developed a mild attack of Small-pox. Source unknown (49).

7. This was another house-group of six cases, revealed by the occurrence of a confluent hæmorrhagic case in an unvaccinated boy of eight, fatal on the 8th day (May 15th), (52). It appeared that on or about the 23rd March a vaccinated child in the same house, aged 15 months (50), had a mild attack of what was supposed to be Chicken-pox. Subsequently, on April 5th, a vaccinated girl of 22 in the same house sickened with a mild attack of what was also supposed to be Chicken-pox (51), about May 14th the father sickened and died on 21st May (53); two other children, Dorothy and May, aged 5 and 11 respectively, sickened on May 21st and May 24th (54, 55). May was

vaccinated on May 14th and this had taken well on the arm, also on the lip, on an accidental abrasion inoculated through her habit of lying with her face on her left arm ; Dorothy had three faint vaccination scars. In spite of the intensity of the infection, which had already caused two deaths in the house, both children escaped with trivial illness. (See photograph).

The above seven groups were to all appearance detached outbreaks, and no line of connection could be traced from one to the other.

No further extension occurred; in most instances the cases were strictly limited to the house in which the initial known case appeared.

A Doubtful and non-characteristic case.

The following case* concludes the history of Small-pox in Bristol and the neighbouring counties in 1909, and raises some points of considerable practical importance :

On Thursday, March 18th, 1909, S. C., a girl, aged 16 (56), living in domestic service in Bristol, complained of a slight sore throat and some headache ; she was well enough to " go out " on Sunday, March 21st, as usual, but apparently got worse later, and Dr. Myles was called in to see her on March 25th. He found that she then had a temperature of 102° F. ; the tongue was furred, the throat and palate injected, and she complained of pain in the back. She also presented a profuse, soft, papular rash, distributed somewhat generally over the body, most marked on the front and outer side of the upper arm, and on the thighs, less profuse on the trunk, very few papules on face and forehead, and none on the wrists.

The papules were flat and of a dark copper colour ; some quite large patches of slightly raised areas occurred, especially on the upper arm, covering the areas of a shilling or half-a-crown. On palpation the papules and

* *British Medical Journal*, Sept. 18th, 1909.

These two sisters (cases 54, 55) lived in a house yielding two fatal cases; the elder girl, aged 11, was vaccinated on May 14th, 1909, and sickened on 23rd, the vaccination scars show up well in the photograph, also the accidental vaccination at corner of lip; the Small-pox eruption is most modified, one or two papules can be well made out on right cheek, and on chin, and two on left forearm, also a few others, the papules all aborted. The younger child, aged five, had been vaccinated in infancy, she sickened on May 21st, and developed a few papules which all aborted; they cannot be distinguished in the photograph which was taken on May 27th. The fatal cases which occurred in an unvaccinated brother and in a man of over 40, not vaccinated since infancy, were too distressing to photograph.

raised areas were softish, and gave the impression of being quite superficial, with the exception of a few on the forearm, which felt more rounded, somewhat deeper in the skin, and more resistant. The eruption on the palate and tonsils was distinctly not papular.

The left arm showed two small scars of primary vaccination.

Although the case presented the appearances of a papular erythema accompanied by fever, and not any characteristic appearances of modified or minimal Small-pox, she was admitted, as a precautionary measure, to an isolation ward in the City Hospitals on March 26th for observation, under the care of Dr. Pauli. On admission the appearances presented were practically unaltered, for though the papules showed no signs of development and they had become less prominent; the temperature on March 26th ranged from 100·4° F. at 10 a.m. to 102·6° F. at 6 p.m.

On March 27th Dr. Pauli noted that the patient presented in the situations named a deep-coloured or dusky erythematous rash, but the raised condition of the skin had subsided, and no papules could be distinguished. The tongue presented the dirty brown appearance often associated with gastric disturbance. On this day the temperature fell rapidly and evenly from 101·8° F. at 2 a.m. to 99·6° F. at 10 a.m., and to 99·0° F. at 6 p.m.

Under simple treatment the tongue very quickly cleaned; the temperature fell to normal by the morning of March 28th and continued normal; at no time was there the slightest indication of vesiculation over any of the spots or patches, nor did the most careful examination disclose the presence of a single papule which suggested even the most modified or abortive form of the true Small-pox papule; the erythema faded quickly, leaving discoloured patches of skin, over which a slight branny desquamation occurred.

The disease was considered to be an acute febrile erythema, which, as pointed out by Dr. Ricketts,† is not neeessarily symptomatie of any aeute specifie fever.

As nothing remained but the diseolouration under the skin, and the patient appeared to be quite well, she was diseharged on April 1st, after a week's stay in hospital, and returned to her home in Somerset, where she remained until April 14th, when she returned to serviee in Bristol.

On April 21st her brother (57), a miner, fell ill with semi-eonfluent Small-pox, from whieh he reeovered, and on April 23rd her father (58) fell ill with Hæmorrhagie Small-pox, whieh proved fatal. Allowing the usual twelve days for ineubation, these attaeks were both eontraeted on or about April 9th to 11th, at whieh time the girl was at home.

Two other eases (59, 60), received infeetion from these and reeovered.

There was no Small-pox in the town where they lived, but seattered cases had oeeurred in the immediately adjoining parts of Glouecstershire during Mareh and April, and had been carried thenee as far as Yeovil. The brother had eeased work the day before Good Friday (April 8th), and on Easter Monday attended the sports at Wells. In Bristol, too, eases of Small-pox had oeeurred at intervals sinee the beginning of January, and a eontaet of a Bristol ease (a drover) was due to pass through their home on or about April 11th.

When at home the girl was seen by Dr. Costobadie, who informs me that there was then slight desquamation about the forearms and on the legs below the knees, but no evidenee of any sore or abrasions of the skin.

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† *The Diagnosis of Small-pox.* By T. F. Ricketts, M.D., B.Sc., M.R.C.P. Cassell and Co., Limited, 1908.

On April 24th, after her return to Bristol, Dr. Myles again examined the patient. She was then apparently in good health, and on examining her skin he found the discoloration persisting over the spots and patches where the rash had been, and in places, particularly over the deltoids, there was a brownish mottling; three of the discolorations on the forearms appeared to be slightly depressed. On May 1st the discolorations over the deltoids had faded considerably, and that over the forearms had disappeared, leaving no trace. A test revaccination performed on this day gave no result.

Upon returning to service the girl had slept with a fellow-servant vaccinated in infancy but not revaccinated; this fellow-servant remained perfectly well, and on May 3rd was revaccinated, and took in two places quite successfully. The rest of the master's family, who were revaccinated in March, also remained in perfect health.

It is important to determine whether, as suggested by the time-coincidence of the attacks of this patient's brother and father, her febrile erythema was a manifestation of the Small-pox poison in her system; if so, it is quite unique in our experience.

The opportunities of infection in the City were at the time very slight, and at the date when she should have contracted the infection there were no known cases at large; furthermore, she enjoyed few opportunities of visiting friends, and those whom she knew and visited were not ill and did not live in an infected district.

The onset of her illness was not so sudden and definite as the onset of Small-pox, however modified, usually is; neither were the course of the temperature nor the appearance, distribution, and development of the rash at all characteristic of modified, minimal, or abortive Small-pox, of which very numerous examples have fallen under our observation at the City Hospitals during the past quarter of a century. A fine branny desquamation is in no sense suggestive of any known form of Small-pox.

On the other hand, the type of Small-pox introduced into Bristol and the neighbourhood, apparently from the Sea of Azov, during the winter of 1908-9, has presented many features not only of malignaney, but of eceentricity. No less than six cases out of 39 oceurring within the City have assumed a fatal hæmorrhagie type sooner or later, the ineubation stage has been in some eases prolonged to fifteen or sixteen days, the usual interval between sickening and development of the papular eruption has been unduly prolonged, and in two instances at least the disease has apparently made an unsuccessful attempt to break down the resistance afforded by recent revaccination in the ease of nurses, who, however, suffered no harm beyond a two or three days' fever, followed by no eruption, and ending in speedy convaleseence.

One of these nurses, returning to duty in the wards of a general hospital into which Small-pox had been inadvertently introduced, appears, however, to have herself been in the condition of an "acute carrier," and to have infeeted a patient in the wards, who subsequently developed a fatal hæmorrhagie attack.

The dull-colour of the immature papular rash in S. C., (56), its failure to form a true papule, and the subsequent dull and persistent staining suggest what is almost a contradiction in terms—a benignant hæmorrhagic attaek. If this is possible, as it may be in the ease of a singularly searching and virulent infection acting upon a highly resistant individual, the experience is worth recording for the guidance of others.

I have to reeord my thanks to the County Medical Officers of Health for Gloucestershire, to the Medieal Officers of Health for the West Gloucestershire Combined Districts, for Warmley, for Yeovil and for Midsomer Norton; also to the County Council of Gloucestershire,

and the Rural District Council of Warmley. The combined work between City and County was carried on absolutely without friction or misunderstanding, and this no doubt contributed to the satisfactory result.

Type of Disease.

As I pointed out in the "Bristol Medico-Chirurgical Journal" (June, 1909), the type of disease was extremely virulent, as shown by the fact that three deaths from Hæmorrhagic Small-pox occurred, all in unvaccinated children, in the district of Bedminster alone, and by the further fact that out of the thirty-nine cases notified six were hæmorrhagic at onset or later, giving a percentage of 15·4 cases hæmorrhagic. The infectivity was also intense, and formed a marked contrast to that exhibited by the introductions round the year 1904. Practically every person who came into contact with the initial Wick case contracted the disease, and 24 cases are seen to have resulted directly or indirectly from this one. The intensity of infective power is also suggested by the bare failure of the disease to break down the very strong barrier of recent vaccination in the case of the two nurses at Cossham, of the two boys in the Bedminster family, and of the two little girls whose photographs are given. These may be classed as "cases," but after the first two or three days there was nothing, or merely the most trivial illness, the matter with them. It is in this way that these intense infections are apt to show a series of cases alternating from extremely mild attacks in the well-protected, to malignant and fatal attacks in the unprotected.

Special Action, etc.

Under the ordinary conditions of introduction into a family, the control of contacts is comparatively simple; and for the past ten years introduced cases of Small-pox have not yielded on an average as many as four cases.

But the tramear episode baffled calculation, and, while it supplied 395 known contacts, left other unknown possibilities, indicated no doubt later by the numerous recurrent outbreaks in City and County which had to be strangled as they arose.

There was nothing for it but to wait events, issue speeial warnings to medical practititioners from time to time, and dispose our force of trained Inspectors for " contact shadowing " as occasion demanded. When the Cossham Hospital attack from the County developed on the eastern boundary the most experienced Inspeetor in this work, (Inspeetor Slade), was placed in charge of the immediate district and the eastern boundary line, two advanced guards were thrown forward into the Connty to co-operate with the County anthorities, two stationed midway in S. Philip, and one Inspector remained on special rear-guard duty in Bedminster. Meanwhile the Common Lodging Honses were systematically visited by the Special Inspector.

Our ehief anxiety at this time was not so mueh the actual City infection, which was kept in hand, as the possible involvement of a Local Board District adjoining the City, whenee mnch trouble might have arisen from transferred infeetion. Fortunately this did not happen.

Liability to Epidemic Small-pox.

There is no reason to conclude that eommunities under modern sanitary conditions are immune to serious epidemics of this disease, so long as the conditions for population-immunity, viz., adequate protection by vaccination and re-vaccination, are absent.

In illustration of this fact the following recent examples of epidemie outbreaks during the present century may be quoted, many of them in towns which may justly boast of excellent general sanitary administration. Bristol, with a decreasing vaccination rate, is similarly susceptible, and may some day have to pay the penalty.

	Date.	Cases.	Deaths.	Case Mortality per cent.
Glasgow ..	1900–1902	2255	283	12·5
Liverpool ..	1902–1903	2280	159	6·9
Dewsbury ..	1904	1302	65	5·0
Hull ..	1899–1900	943	162	17·0
West Ham	1901–1902	874	154	17·0
Leicester ..	1903–1904	727	26	3·5
Swansea ..	1902	187	33	17·0

The remarkable variation in the case-mortality, indicating variation in type of the disease, is to be noted; this varies from 3·5 in Leicester in 1904, to 17·0 in Hull, West Ham and Swansea in 1900, 1901, 1902.

Round the year 1904 an extremely mild form of Small-pox was noted in many places, and the 34 cases in Bristol in that year yielded only one death, giving a case mortality of 2·9; compared with the 39 cases of 1909 which yielded eight deaths, giving a case mortality of 23·0

SPECIAL EXPENDITURE.

It may be interesting to discuss the cost of repressing this series of dangerous introductions of Small-pox, for comparison with the cost of dealing with the disease after it has become prevalent.

Hospital Expenses.

The experience of the past fifteen years has led to the habit of utilising Novers Hill Hospital, in the intervals of Small-pox, for cases of Scarlet Fever, in relief of the meagre fever accommodation otherwise available in the City.

It is thus, Small-pox or no Small-pox, practically always in use, and will accommodate forty cases of fever; it appears from figures kindly supplied by the Accountant

that the cost of this Hospital for the six months from 19th June to 19th December, 1908, when there was no Small-pox, amounted to £695 9s. 11d. The cost of the Hospital from 19th December, 1908 to 19th June, 1909, when it was fully engaged nursing Small-pox, amounted to £709 18s. 5d.; an extra cost, due to Small-pox of £14 8s. 6d.

The extra cost of the special work in the Health Department due to Small-pox for the six months from 19th December, 1908, to 19th June, 1909, amounted to £186 14s. 6d.

Inspector Slade, who bore the brunt of the work round Cossham Hospital, and the danger-zone on the eastern boundary, unfortunately contracted Pleuro-pneumonia from exposure, aggravated by his plucky persistence on duty when already ill. The weather of March, 1909, was unusually inclement.

City of Bristol—(An undeveloped Outbreak).

The total extra cost due to Small-pox for the period from 19th December, 1908 to 19th June, 1909, is thus distributed :—

	£	s.	d.
Hospitals	14	8	6
Health Department Expenses (including Medical Assistance)	186	14	6
	201	3	0
Less income for maintenance of out-district patients (Warmley R.) ..	66	15	0
Total extra cost of Outbreak defrayed by Council	£134	8	0

Taking the whole cost of the Hospitals with other expenses, the total would amount to £829 17s. 11d.

It is not often that the actual expenditure on a *developed* epidemic of Small-pox can be ascertained, but in the year 1902, West Ham, a County Borough with a population of 275,408, published an account of the cost of an epidemic of Small-pox lasting for eleven months from October, 1901, to September, 1902, and comprising 836 cases.

West Ham—(A Developed Outbreak).

The cost was distributed thus :—

	£	s.	d.
BOROUGH OF WEST HAM.			
SMALL-POX HOSPITAL—			
Equipment and Maintenance, less income for maintenance of out-district patients	5,310	13	11
MISCELLANEOUS HOSPITAL EXPENSES—			
Maintenance in other Hospitals, Cleansing, Notifications, Contact Shelter, Funeral Expenses, Conveyance of patients, less repaid in respect of out-district patients	4,173	19	3
PERMANENT WORKS—			
In regard to Contact Shelter, Enquiry Office, etc.	1,787	4	2
Total expenditure charged to revenue ..	11,271	17	4
Expenditure charged to Capital—erection of Temporary Buildings	15,200	0	0
Total expenditure defrayed by Council	£26,471	17	4

Although "contact shadowing" may appear to the uninitiated to be a matter of extreme simplicity, and the uniform success hitherto attained has obscured the amount of effort expended in attaining it ; I may point out that the making of 16,000 enquiries is no child's play, and the work involved is exacting, tedious and anxious. Instructions may readily be given, but the success of a campaign depends, apart from the securing of vaccination, upon the intelligence and absolute fidelity with which instructions are carried out. Any scamping of supervision might involve disaster, of a kind readily suggested by the results from the "missed" cases.

I think it would encourage that zeal and interest which is essential to success if the Inspectors felt that they were secure against undeserved loss.

Small-pox Precautions.

The Law of Vaccinal Protection.

(1). A person who has recovered from a disease such as small-pox is, as a rule, protected from having the same disease again.

(2). This protection is very marked immediately upon recovery, but it fades with time, thus, after 20 years, second attacks of small-pox may occur.

(3). Vaccination, which is small-pox changed into a mild disease by its passage through the cow, similarly protects against small-pox.

(4). This protection is very marked immediately after vaccination, but it also fades with time, and, as the disease is milder, its protection is less; thus, after ten years, once vaccinated persons are again liable to contract small-pox, though they will probably have it in a much milder form than if they had never been vaccinated.

(5). After 20 or 30 years, the protection has faded very greatly, and such persons may suffer from severe small-pox, even though vaccinated in infancy.

(6). Hence, because a person of 30 or 40, who has been vaccinated in infancy, dies of small-pox, it is no argument against the protection of a recent vaccination; it simply shows that he has neglected to renew the temporary protection conferred by infant vaccination, which is sure to fade with advancing years.

(7). It is necessary then, to avoid risk of small-pox, to repeat vaccination after ten years of age. This re-vaccination renews the protection, and is generally suffi-

cient, except for doctors and nurses, who, being much exposed, are wise to renew their protection, and so make certain, every few years. After a second vaccination it rarely produces a bad arm.

(8). Persons are not protected until the vaccination produces its constitutional symptoms at the end of about eight days.

(9). Thus if a person is exposed to small-pox for six days and is then vaccinated, the small-pox will show itself in six more days, before the vaccination has had time (eight days) to fully protect the constitution ; this, then, is no argument against vaccination, but it is a strong argument against delay in securing re-vaccination until it may be too late. Even in such a case, the late vaccination may control the severity of the attack, and there is a vast difference between a very mild case involving no danger to life and a severe or fatal case such as occurs in the unprotected.

(10). Persons who have secured the renewed constitutional protection of re-vaccination before being exposed to small-pox, run no risk. This is definitely established by the experience of doctors, nurses, and others dealing daily with small-pox in hospital wards.

(11). Vaccination or re-vaccination that does not "take," does not count as protective vaccination.

(12). Any arguments not based on these rules, which are the basis of modern advice as to vaccination, are invalid and not to the point, though they may mislead people who do not think carefully.

(13). Small-pox is not caused by impure water supplies, bad drainage, uncleanliness, or any insanitary conditions ; it is a disease which develops only in susceptible persons, who catch it from Small-pox patients directly or indirectly.

(14). Two things, then, are necessary in stopping Small-pox; First, isolation of patients and destruction of infection in their immediate clothes and surroundings; secondly, the rendering other persons insusceptible by renewing their vaccination protection at least once after ten years. By doing this Germany has practically abolished the disease, and has no need for small-pox hospitals.

(15). In every epidemic of small-pox, what happens is exactly what should happen if the above propositions are true. We may, therefore, assume that they are true.

D. S. DAVIES, M.D.,
(Medical Officer of Health).

Public Health Offices,
40 Prince Street, Bristol.

March, 1909.

Visits paid to Small-pox Contacts during 1909.

Inspectors.

Leat	26	*Drafted into County.*
King	45	
Hasell	44	
Wreford ..	930	Contacts of Group A.
Dimond ..	3,008	Common Lodging Houses
Bush	789	Bedminster.
Crofts	236	*Drafted into County.*
Wilkinson ..	74	
Best	1,851	Bedminster.
Kirley, H. J. ..	1,385	Central Districts.
Griffiths, A. W.	3,560	S. George, Bedminster, and relief work.
Slade	4,450	Cossham Hospital and eastern boundary
	16,398	

Supervision of contacts involves responsibility from early morning till late at night over all outgoings and incomings of contacts, visitors, etc., together with a daily report and a record of observations suggesting possible danger.

Medical Visits to Small-pox Cases, ? Small-pox Cases, and Contacts.

Medical Officers.

Visits to S.P. Cases at home ..	27
Visits to Cossham Hospital	8
Re-visits to Infected Houses	15
Visits to ? S.P. Cases	116
Re-visits to ? S.P. Cases	13
Visits to Schools attended by Infected families	3
Common Lodging House night visits ..	3
Total ..	185
Visits to Novers Hill *re* Small-pox (including special Clinical Demonstrations)	24

Two visits were also made to cases outside the City.

A Medical Officer of Health is not required to traverse the diagnosis of a Medical Practitioner, nor to assume the responsibility of making or correcting a diagnosis. On this understanding friendly visits are paid on request of practitioners in order to consult generally and without prejudice as to the advisability of removal to Hospital or other precautions.

Vaccination.

Although the rigid searching out of contacts, coupled with isolation of all actually infected or suspected cases, is an important point in controlling the spread of Small-pox, this could not possibly succeed alone, nor without the protection of vaccination. In an unvaccinated population the number of attacks increases so rapidly that efforts at control are speedily overwhelmed ; without vaccination one is unable to protect the immediate contacts of the patient, or to ensure the immunity of the Medical, Nursing, and Inspecting Staff employed.

In a perfectly vaccinated and re-vaccinated community the immense trouble and expense of contact shadowing, as well as of Isolation Small-pox Hospitals would be avoided. In a partially vaccinated community both vaccination and re-vaccination as well as contact supervision must work hand in hand. There is nothing new in the principle, the success of which depends upon the public spirit and fidelity of the Inspectors.

Opposition to vaccination was exhibited not only from without but within the Health Committee, but the support of the majority ultimately prevented the débâcle which would have occurred through hampering the action of your Medical Officer.

One unexpected but fortunate result of the heated discussions was that private firms undertook on their own initiative the duty which the Public Vaccination

Authority refused, and in this way a far larger amount of re-vaccination was secured in the City than upon any previous occasion within my knowledge, and this was a valuable asset towards safety.

VACCINATION.

Half Year ending 30th June, 1909.

Returns from 186 Medical Practitioners.

Vaccinations	3,914
Re-vaccinations	18,903
	22,817

Returns were not received from 55 Medical Practitioners, and in nine instances no records had been kept.

HOSPITAL ACCOMMODATION.

An account of the outbreak would be incomplete without an acknowledgment of the valuable services of the Matron at Novers Hill (Miss Watt) who organised a working staff at a moment's notice under circumstances of extraordinary difficulty. She was ably seconded by the Nurses and Domestics of whom she reports—

> "the Domestic staff worked splendidly and never complained, and the male staff were always willing and ready when asked to do night duty with delirious patients although they had been at work all day."

EXTRACT FROM THE THIRTY-EIGHTH ANNUAL REPORT OF THE LOCAL GOVERNMENT BOARD, 1908-09.

Supplement containing the Report of the Medical Officer for 1908-09.

Presented to both Houses of Parliament by Command of His Majesty.
(Page IX.)

SMALL-POX.

" Small-pox occurred in 13 towns during 1908, the largest number of cases occurring in the ports of Liverpool and Southampton. In nearly every instance the infection appeared to have been imported from foreign districts in which Small-pox prevailed. During the first quarter of 1909, six cases of Small-pox were notified in London, and several in provincial towns. A somewhat severe outbreak in Bristol deserves special note. Altogether 35 cases occurred in that City, of which nine were fatal; in neighbouring districts 22 cases with three deaths occurred. There is no doubt that had it not been for the prompt vaccination or re-vaccination of contacts, and for the consummate skill in tracing sources of infection and in watching contacts, displayed, not for the first time, by Dr. D. S. Davies, the Medical Officer of Health of Bristol, the outbreak would have been on a much larger scale.

As in similar outbreaks elsewhere, infection was introduced from abroad; and the non-recognition of earlier cases before " warning notices " to medical practitioners had been issued, bore an important part in spreading infection before control could be exercised. The non-recognition of an anomalous hæmorrhagic case led to a second introduction of Small-pox into a City Hospital for general diseases. In order that administrative action within and without the City might be co-ordinated, the Health Committee of the Town Council of Bristol, with praiseworthy insight into the special needs of the case, accepted the responsible advice given to them to lend Officers to the affected districts outside the City to assist in tracing out and watching contacts thus enabling the same supervision to be exercised throughout the whole of the affected area. The extent of supervision involved in this statement may be inferred from the fact that the contacts with the above 35 cases numbered 1,354 and 16,398 visits were paid to them.

The method of control consisted in the immediate vaccination or re-vaccination of all known contacts, each case as it arose being promptly surrounded by a ring of vaccinated friends and relatives as well as of sanitary staff; the vaccination of all other inhabitants of the same district willing to be vaccinated; the supervision as already indicated of all contacts; and the immediate isolation of all suspected persons.

At a time when it appeared not unlikely that the outbreak might become widespread, Dr. Sweeting, one of the Medical Inspectors of the Board, attended a meeting of the Bristol Board of Guardians, urging them to provide special facilities for vaccination and re-vaccination. This they refused to do, but the public discussion at this meeting, and the Health Committee's public posters advertising the present facilities for vaccination served the double purpose of increasing the number of persons protected by vaccination and of publishing the danger of Small-pox, and especially the danger of failure to recognise cases of this disease.

The efficiency of measures against Small-pox, in the absence of complete protection of the population by vaccination and re-vaccination, is best secured under present administrative conditions by the active co-operation of the sanitary authority and the board of guardians immediately a case of this disease occurs; the one to secure the immediate isolation of the sick and the supervision of contacts with them, the other to secure the early vaccination not only of known contacts, but of others in the same district who are at present unprotected by vaccination. In Bristol, the necessary vaccination of contacts, and the vaccination of many others, was secured notwithstanding the unwillingness of the Board of Guardians to take additional steps. The Sanitary Authority is to be congratulated on the success under circumstances of great difficulty of its very completely organised arrangements for preventing what would otherwise probably have been a great epidemic."

Scarlet Fever or Scarlatina.

During the year 1909, 692 cases of Scarlet fever were notified, and 12 deaths occurred, giving a case mortality of 1·7 per cent.

The prevalence of, and fatality from, this disease for the past twenty years, that is to say, since Notification commenced, is shown here. Columns 2 and 4 should be used in comparing different years, as they are adjusted for the varying populations.

SCARLET FEVER.

	1	2	3	4	5
Year.	Cases Notified.	Attacks per 100,000 Living.	Deaths.	Deaths per 100,000 Living.	Case Mortality per Cent.
1890	559*2	253	40	18	7·1
1891	888	400	37	17	4·1
1892	1,442	644	47	21	3·2
1893	1,245	553	35	16	2·8
1894	485	214	16	7	3·2
1895	562	252	16	7	2·8
1896	1,352	586	59	24	4·3
1897	511	220	18	7	3·5
1898*	382	120	14	4	3·6
1899	697	217	13	4	1·8
1900	1,971	606	39	12	1·9
1901	2,206	679	36	10	1·6
1902	2,724	793	66	19	2·4
1903	2,168	639	49	14	2·2
1904§	1,258	366	36	10	2·8
1905	1,085	302	39	10	3·5
1906	1,019	280	27	7	2·6
1907	886	240	26	7	2·6
1908	486	127	10	2	2·0
1909	692	183	12	3	1·7

* City Extended. § The City was further Extended in 1904.

*2 Notification commenced on February 12th, 1890, so that the case mortality for this year is probably overstated.

The type of disease has again been mild, and the mortality is the lowest, excepting that for 1908, recorded over a long series of years.

The distribution of attacks by age is shown below :—

0–1	1–5	5–15	15–25	25+	Total.
8	178	438	52	16	692

The distribution of the disease in each quarter of the year is shown in the following table for each Registration Sub-district of the City :—

SCARLET FEVER.

REGISTRATION Sub-District.	CASES NOTIFIED.				Year, 1909	Attack Rate per 100,000 Living
	1st Qr.	2n l Qr	3rd Qr	4th Qr		
Ashley	23	10	18	14	65	136
Bedminster	31	44	28	33	136	190
Bristol Central ...	15	15	14	18	62	167
Clifton	44	45	18	17	124	272
Knowle	5	8	7	4	24	134
S. George	34	25	24	19	102	142
S. Philip	10	27	21	20	78	162
Stapleton	27	14	17	8	66	244
Westbury-on-Trym ...	—	7	1	13	21	183
Public Institutions ...	5	4	2	—	11	—
Not belonging to City ...	1	1	1	—	3	—
Total	195	200	151	146	692	183

The attack rate per 100,000 population was lowest in Knowle, Ashley and S. George, and highest in Clifton and Stapleton.

Isolation in Scarlet Fever at a public Hospital is not needed for the children of persons in good circumstances, who will indeed do as well or better at home at the expense of some little inconvenience and trouble to the parents. Isolation Hospitals have their use in securing isolation in cases which cannot possibly receive adequate attention at home ; as, for example, amongst the homes of the poorer wage-earners, with large families and few rooms.

The epidemic of Scarlet Fever which began in 1900 afforded the first opportunity we have had of observing the habits of this disease in the extended City. The added districts proved very susceptible of infection, as was anticipated, and the immense increase in population and area has had the marked effect of prolonging the outbreak, which, however, showed a very marked decline in 1907 and reached its lowest point in 1908.

The prevalence of Scarlet Fever bears no relation to the " Sanitary " condition of the district, it is a contact-spread disease, and is largely kept alive by mild cases which may be unrecognised (missed cases—" carriers "). The influence of infected clothing and infected premises in this disease has probably been over-estimated, while the influence of " personal " infection has been much under-estimated. Schools may have considerable influence in the spread of Scarlet Fever, but this is minimised by the strict watch kept upon the notification returns in connection with school attendance.

The difference in the fatality of Scarlet Fever forty years ago and now is quite remarkable. For instance, in 1863 and the following year over 1,100 deaths occurred from this disease. In 1869 and 1870 over 900 deaths occurred,

in 1875 and 1876 over 700, and in 1880 and 1881 nearly 400. In 1886 and 1887, 300 deaths occurred. The next epidemic was in 1896, when 59 deaths resulted. In 1900 a larger epidemic caused only 39 deaths, in 1901 a still greater prevalence of the disease resulted in only 36 deaths, while in 1902 the deaths rose to 66. The population in 1909 was 377,642 compared with 158,000 in 1863, If there had been a similar loss in regard to population as there was in the epidemic of 1863, the number of deaths in 1909 would have reached 2,000 instead of being only 12.

The Death-rate for Scarlet Fever, 3 per 100,000 population, is the lowest rate ever recorded in the City, with the exception of 2 per 100,000 in 1908, and the attack rate of 183 per 100,000 population is the lowest rate since Notification commenced in 1890, with the exception of 1898, when it was 120, and 1908, when it was 127.

The type of disease, judged by the case mortality, is much milder now than it was 40 years ago, hence it is argued that we may revert to the fatal epidemics which were then experienced. But the favourable alteration in type is probably, in large part, a result, not of general "sanitary" improvement, but of the development of that part of Public Health work which secures removal and care in Hospital for those patients who, if kept at home amongst large families in small houses, would, by accumulation of infection, lead to septic and fatal forms of the disease. It is in this, I believe, that the value of a judicious use of isolation hospitals consists; for in large cities it is not to be expected that hospital isolation can succeed in blotting out a disease which is perennially kept going by personal infection through undiscovered cases. It is noteworthy that the improvement in the fatality returns has been maintained in spite of the unfavourable factor in recent years of increasing school attendance.

Enteric Fever (Typhoid Fever).

During the year 1909, 66 cases of Enteric Fever were notified, and 12 deaths occurred, giving a case mortality of 18 per cent.

The prevalence and fatality from this disease for twenty years past is here shown :—

ENTERIC FEVER.

	1	2	3	4	5
Years.	Cases Notified.	Attacks per 100,000 Living.	Deaths.	Deaths per 100,000. Living	Case Mortality per Cent.
1890*[2]	122	55	33	14	27·0
1891	116	52	23	10	19·6
1892	135	60	18	8	13·3
1893	122	54	26	11	21·3
1894	90	39	21	10	23·3
1895	89	39	22	9	24·7
1896	110	47	20	8	18·1
1897	343	147†	47	21	17·4
1898*	113	35	26	8	23
1899	219	68	35	10	16
1900	293	90	44	13	15
1901	281	85	40	12	14
1902	319	93	58	17	18
1903	134	39	21	6	15
1904‡	172	50	26	7	15
1905	76	21	13	3	17
1906	120	33	21	5	17
1907	74	20	15	4	20
1908	103	27	10	2	9
1909	66	17	12	3	18

* Extended City † Milk Outbreak introduced from the County

*[2] Notification commenced February 12th, 1890, so that the case mortality for this year is probably overstated. ‡ City again extended in 1904

No estimate can be made as to the number of cases occurring before 1890, the high figures of 1897 are due to the introduced milk outbreak of that year. In 1897 the City, containing 232,242 people, was extended, and in 1904 contained 343,204 persons, an increase of 110,962 persons. In 1904, a further extension was made. Allowance in columns 2 and 4 is made for the increase of population year by year, and the figures in these columns should be used for comparison. The attack rate fell very considerably in 1903 and 1904 from the high rate of 1902, and the death-rates (Col. 4) for the years 1903 and 1904 were the lowest recorded up to then.

In 1908 the attack rate rose slightly compared with that of 1907, but the number of deaths, the death rate, and the case mortality per cent. are the lowest on record.

In 1909 the attack rate was the lowest recorded since Notification began in 1890, but the number of deaths and the death rate rose slightly compared with 1908. The rise in case mortality to 18 per cent. suggests that the type of infection was more severe than in 1908.

The distribution of the disease in each quarter of the year is shown in the following table, for each Registration Sub-district of the City. The Sub-districts most affected are seen to be Knowle, Bristol Central, and Westbury-on-Trym.

REGISTRATION. Sub-District.	Cases Notified.				Year 1909.	Attack Rate per 100,000 living.
	1st Qr.	2nd Qr.	3rd Qr.	4th Qr.		
Ashley	—	1	1	2	4	8
Bedminster	1	1	4	1	7	9
Bristol Central	2	2	3	3	10	27
Clifton	—	1	—	—	1	2
Knowle	—	—	4	9	13	72
S. George	1	2	1	—	4	5
S. Philip	3	2	2	1	8	16
Stapleton	1	1	—	—	2	7
Westbury-on-Trym ..	1	—	1	1	3	26
Municipal Institutions ..	1	1	—	1	3	—
Not belonging to City ...	3	—	5	3	11	—
Total ...	13	11	21	21	66	17

Enteric Fever is admitted for treatment into the Public Institutions, and 57 cases (10 from outside the City) were nursed in the Royal Infirmary, General Hospital, and Ham Green Hospital, through the year. With the exception of 12 cases nursed at Clift House in 1897, no provision had been made for this disease in the City Hospitals before July, 1899, and cases, if not admitted to the general Hospitals, had to remain at home. There is still insufficient general isolation accommodation to meet any emergency, and this insufficiency has been considerably accentuated by the extension of the City and the consequent great increase in population, as well as by the undertaking to provide for the Guardians' cases, and by the closing (July, 1906) of Clift House Hospital for Diphtheria.

TYPHOID FEVER IN BRISTOL IN 1909.

Example of a "Creeping" Outbreak of Typhoid Fever, in Totterdown.

The occurrence of an explosive outbreak of Typhoid Fever such as attends the implication of a public water supply, a milk supply, or of oyster-beds, while it makes for notoriety, is, perhaps, of less intimate importance to the community than the elucidation of the factors which conduce towards the endemic persistence of the disease amongst populations, and thus supply the material, when circumstances favour, for an explosive outbreak.

The Typhoid Fever bacillus needs little else, in order to secure its continuance as a parasitic species, than opportunity of transference from bowel or bladder of its presene host to the mouth of a succeeding host. This transference is readily made by soiled hands during domestic food preparation, or, given ordinary carelessness in domestic habits, in other ways; while the insidious and often prolonged sickening period gives ample opportunity for

the infective but unsuspected patient to become an "effective" centre of infection.

The following outbreak gives an example of a steady creeping infection persisting over some months. In this method of spread it is essential to note the importance of personal infection; drains have no concern with the transference of infection.*

During the fourth week in August the following cases were notified:—

1.	Albert D., father,	49	13 C——— Road, Brislington.
2.	Mabel D., daughter,	9	
3.	Albert D., son,	4	

and were admitted to the Royal Infirmary, where the father died on August 30th. He had apparently been ill for some time before the nature of his illness was recognised, and was probably the first case of the series; it is uncertain where he contracted the infection, he was in the employ of a market gardener, took vegetables to market and carried back manure from town stables.

On September 15th the family moved into 87 P—— Street, Totterdown, and from this address came the following cases in September—October:—

4.	Charles D., son	6	87 P——— Street, Totterdown.
5.	Mrs. D., wife,	46	

It appears that, some time in October, a boy named Albert B., 8 M., attended the Bristol Dispensary, and received treatment for "Pneumonia." If we consider him as possibly a "missed" case of Typhoid Fever, he may supply a connecting link. He lived at 98 P—— Street, almost opposite 87, and was a playmate of the D. family.

?6. Albert B—n, 8, 98 P—— Street, Totterdown.

* The drains were carefully tested in each instance, but no defects found; some of the houses are comparatively new, and in others the drains have only recently been reconstructed.

In October–November the following cases were notified :—

7. Edith B-t-n, 7, 4, K—— Terrace, near to P—— Street, a playmate. Died.

8. Dinah C., 56, F., 19, C—— Road, Brislington. Nursed cases 2, 3, 4. Died.

9. Doris S., 7, F., 8, H—— Cottages, near to P—— Street—a playmate.

10. Violet W., 7, F. 14, F—— Street, Totterdown. This child visited 87 P—— Street, and nursed the baby while Mrs. D. (Case 5), was visiting the patients in the Infirmary ; and on her return had tea and supper.

In November–December the family of the boy Albert B. (Case ?6), furnished the following notifications, the infection may have been derived through him, or from children of the D. family, who were playmates.

11. Gladys B—n, 7
12. Sarah Jane B—n, 36
13. Mabel B—n, 6
14. Samuel B—n, 4
15. Samuel B—n, 37

98 P—— Street, Totterdown. (Opposite 87).

16. Edward S., 24. 8 G—— Street, Bedminster—uncle of Case 7, visited her early in October—notified early in November. Died.

In January, 1910, the following cases occurred :—

17. Grace W., 9. 94 P—— Street, Totterdown. The mother of this child assisted in nursing the B—n family before their removal to Hospital.

18. Frank M., 5. 2 C—— Cottages, near P—— Street—a playmate.

19. Ernest M., 12., brother of 18. This boy was detected and removed to Hospital for observation during initial stage.

This group of 19 cases, 10 (or 11 counting Case ?6) of which were supplied by two families, and in which a link of personal communication can be traced in the remaining cases, points to a strain of considerable virulence, indicated by the four fatal cases and the ready implication of playmates, and illustrates the creeping method of spread extending over five or six months, which may occur through a family and contacts where the possibilities of complete isolation and strict sick-room routine are small. The infection in both families was probably distributed before the first case in each came under observation, as the father in the D. family was ailing for some time before he sought advice, and the first case in family B—n was apparently very mild and therefore "missed" (Case ?6). The indefinite onset of Typhoid Fever conduces to the difficulty of securing early recognition. Although the mother was attacked in both families, and may have contributed to the distribution of the disease by hand-fouling of food, the evidence as to this is not conclusive. The course of the outbreak is instructively dissimilar from the explosive outbreaks associated with the implication of water or of milk as distributors.

An outbreak of this kind presents considerable difficulties in control, as it is impossible to obtain a full list of casual playmates, and watch them as contacts. Supervision was exercised from the first over the households known to be affected, but the occurrence of a "missed" case in a fresh family, such as case ?6, Albert B—n, sets at naught the effect of such supervision, and affords opportunity for unchecked infection of a new group of cases.

The D. family consisted of six persons, of whom five were attacked, including the father and mother; these were all removed to Hospital; the remaining child,

May, 1., F., was admitted to the Guardians' Scattered Homes and remained well.

The B—n family consisted of seven persons, of whom five were attacked, including the father and mother; these were all removed to Hospital, the remaining two children, Albert, 8, M., and Ivy, 2, F., were admitted to the Guardians' Scattered Homes, and remained well.

After the occurrence of the B—n group of cases, we decided to adopt the method of warning notices to Medical Practitioners in the District, which has proved so useful with Smallpox, in order to put them on the *qui vive* in the case of indeterminate "continued" fever, so that no time might be lost in securing notification and isolation. At the same time the affected houses were kept under particular supervision. The wisdom of this course of action was soon apparent; for on February 4th District Inspector King reported that a boy Ernest M., 12, M. (Case 19), (the brother of a previous case (18) notified during the third week in January) was ailing. Through the prompt kindness of Dr. Pinniger, the case was declared to be suspicious, and was at once taken into an isolation Ward for observation. At this time the Widal test proved negative, but the case developed into a typical attack of Typhoid Fever and the positive reaction duly followed on 10th February.

There were four other children in this family open to infection and the early detection and isolation of this case may no doubt have prevented extension through the family.

It was hoped that this case removed to Hospital on February 4th, was the last of the series, and nothing further occurred until March 27th, when

20. George W., 20, M.

a brother of Grace W. (Case 17), was notified and removed to Hospital with Typhoid Fever. Now Grace W. was

notified on January 20th, and the two months' interval suggested a "missed" case. Accordingly on April 1st I obtained samples of blood from all the remaining members of this family, viz. Mr. W., Mrs. W., Daisy W., 17; Gladys W., 14; and Winnie W., 10. They all gave negative reaction except Gladys, 14, who gave a marked Widal reaction in 1/50 dilution. She had from January 25th to March 8th been attended at a Dispensary for "Rheumatic pains and general malaise," which was probably an attack of Typhoid Fever quite unsuspected.

She was taken to Ham Green Hospital for observation, and makes case

21. Gladys W., 14, F.

At the same time the father (Case 22), who did not feel well, was admitted for observation, and proved later to be a case of Typhoid Fever.

22. Mr. W., 46, M.

This ended the outbreak.

In 1899, a somewhat similar outbreak occurred in St. Philip's Marsh, Bristol, which was described in my Annual Report (pp. 27–34), and the facts suggested that personal communication was largely responsible for the spread of disease.

Thus, of 48 houses in A—— and M—— Streets, seven were affected, and five of these were inhabited by relatives. At No. 32 A—— Street, a small general shop, occurred four cases and three deaths; three doors off lived a brother whose wife and two children sickened, two other children were removed to a relative at No. 1, where they subsequently sickened. At No. 23 A—— Street and 111 M—— Street, cases also occurred amongst relatives. At No. 1 J—— Street lived a woman who acted as general Nurse in the District, her son was amongst the early cases. At 16 T—— Street, a child of the person who nursed the case at No. 20 A—— Street, was ill with Typhoid Fever.

Reference may also be made to Dr. Priestly's account of three localised outbreaks in Lambeth, in which there was evidence pointing to personal spread of the disease amongst families and friends (British Medical Journal, January 6th, 1900, p. 35.)

CITY OF BRISTOL.

Creeping Outbreak of Typhoid Fever from August, 1908, to April, 1910.

No.	Case.	Age. M.	Age. F.	Probable date of Onset.	Date of notification.	
1	A.D.	49		17 Aug., 09	26 Aug., 09	
2	M.D.		9	16 Aug., 09	24 Aug., 09	Same Family.
3	A.D.	4		19 Aug., 09	26 Aug., 09	
4	C.D.	6		?	28 Sept., 09	Removal to P— Street on Sept. 15.
5	M.D.		46	?6 Oct., 09	26 Oct., 09	
?6	A.B.	8		?	—	Playmate of D. Family. History of "Pneumonia" in October. Same family as Cases 11–15.
7	E.B.		7	25 Sept., 09	1 Oct., 09	Playmate of D. Family.
8	D.C.		56	1 Oct., 09	11 Oct., 09	Nursed cases 2, 3, 4. Died.
9	D.S.		7	1 Oct., 09	25 Oct., 09	Playmate.
10	V.W.		7	30 Oct., 09	10 Nov., 09	Visitor to D. Family: had meals.
11	G.B.		7	22 Nov., 09	30 Nov., 09	
12	S.J.B.		36	20 Nov., 09	30 Nov., 09	
13	M.B.		6	22 Nov., 09	3 Dec., 09	Same family—playmate of D. family.
14	S.B.	4		23 Nov., 09	3 Dec., 09	
15	S.B.	37		8 Dec., 09	15 Dec., 09	
16	E.S.	24		?	3 Nov., 09	Visited Case 7.—Died.
17	G.W.		9	?1 Jan., 10	20 Jan., 10	Patient's mother nursed B. Family.
18	F.M.	5		?7 Jan., 10	24 Jan., 10	Playmate.
19	E.M.	12		3 Feb., 09	10 Feb., 10	Sickened on 3 Feb.—removed to Hospital for observation on 4 Feb. Brother of case 18.
20	G.W.	20			27 March, 10	Brother of Grace W. case 17
21	Gl.W.		14	about Jan. 25, 10	"Missed"	Sister of Grace W, case 17
22	Mr. W.	46		?	22 Apr., 10	Father of cases 17, 20 and 21 Removed to Hospital for observation on 4 April.

TYPHOID FEVER—CHRONIC TYPHOID CARRIERS.

The following instances of continuously infective persons, or Chronic Typhoid Carriers in Bristol and the neighbourhood have been recorded :—*

A. Mrs. H——, 50, F. Cook

Jan.—March,	1901	Suffered from attack of Typhoid Fever.
May—Sept.,	1904	Cook at Girls' Home, Brislington—25 cases, 2 deaths.
May,	1905	Cook at Girls' Home, Clifton—1 case.
Sept.—Nov.,	1906	Cook at Brentry Home for Inebriates—5 cases
May—Nov.,	1907	Cook at Brentry Home for Inebriates—24 cases, 2 deaths.
May—June,		Herself suffered from Typhoid Enteritis (Brentry).
July,	1908	Case of Typhoid in woman associated with her (Brentry).
August,	1908	Two cases of Typhoid in women associated with her (Brentry).

As already reported, she was shown to pass, at intermittent periods, large quantities of Typhoid bacilli in her stools, and her "effective" periods appeared to definitely begin about May. **.

B. Mrs. H——n, 30, F. Housewife.

September,	1907	J. H—n, husband, died of Typhoid Fever.
October,	1907	Mrs. H—n had a mild attack of Typhoid Fever
June,	1908	Four of her five children developed Typhoid Fever.

No other causes could be found to account for infection, Mrs. H——n's blood gave a marked agglutination reaction (1–200) in June, 1908, the examination of fæces was negative, but the patient proved refractory and this could not be proceeded with.

An interim Report on investigation into this case was presented from the Public Health Laboratory of the University of Bristol, by the Professor of Pathology

* Annual Reports of the Medical Officer of Health for the City of Bristol, 1907, 1908.

** The "effective periods" of Typhoid "Carriers."—D. S. Davies, M.D. and I. Walker Hall, M.D., **The Lancet,** Nov., 28, 1908.

(Prof. I. Walker Hall, M.D.), and was published in the Annual Report for 1908.

C. Miss L. C——, 32, F. Cook.

July,	1905	Suffered from a severe attaek of Typhoid Fever at Calne ; on reeovery went home to farm at Corsham.
September,	1905	A sister at home developed Typhoid Fever.
December,	1905	Her father developed Typhoid Fever and died.
Deeember,	1905	A brother developed Typhoid Fever.
July,	1907	A sister—home from Canada—developed Typhoid Fever.
July,	1908	A parlour-maid and a house-maid in the same situation where she was eook at Piekwiek, developed Typhoid Fever.
September,	1908	A kitehen-maid in another situation where she was cook, developed Typhoid Fever.
Deeember,	1908	A nurse attending on her in the Bristol General Hospital, where she was under observation, developed Typhoid Fever.
Jannary,	1909	Admitted for observation and experiment with a view to eure, to Ham Green (City Fever) Hospital.

Prof. Walker Hall was entrusted by the Health Committee with the prosecution of research into the possibility of cure, and has presented three Reports, the first of which was printed in my Annual Report for 1908, the two others follow here :—

To the Health Committee of the Bristol Corporation

Second Interim Report of the Investigation upon "Typhoid Carriers" by the Bristol University Public Health Laboratory.

The first interim report was concerned with the case of Mrs. H. Since its presentation this patient has received further treatment, has remained free from further attacks, and has not caused an outbreak of the fever in others.

The present report deals with the case of Miss L. C., who was ill with Typhoid Fever at Calne in July, 1905. According to the details supplied by the Medical Officer of Health, Dr. D. S. Davies, the patient returned to her

home in Corsham when she was well enough to travel. In September, 1905, a sister, living at home, had Typhoid Fever, and her father and brother were taken ill with the same disease in December, 1905. In July, 1907, another sister home for a few months from Canada, developed Typhoid Fever. In 1908, L.C. left home and took a situation as Cook ; while in this place the parlour-maid and House-maid were attacked with Enteric Fever in July of the same year. The next case with which she was associated was that of a Kitchen-maid in September, 1908, in another house where L. C. was acting as Cook. On November 28th, 1908, L. C. was admitted voluntarily into the Bristol General Hospital for observation ; while there, a Nurse, engaged in looking after her, developed Typhoid Fever.

This carrier appears to have caused Typhoid Fever in eight individuals and these patients have formed possible centres for new infections. But this is not all. There may have been some undiscovered cases of " latent " Typhoid Fever due to the same carrier, and these in turn may have infected other people, some of whom may become " carriers." We have thus to deal with a widely spreading contagion, comparable almost to the " snowball " type of letters lately so prominent as a means of tapping a large number of possible contributors to some necessitous charity.

The arrangements sanctioned by the Health Committee for the investigations upon this patient have proved to be very satisfactory. The patient herself is anxious to aid the enquiry in every way, and carries out the prescribed regulations in an intelligent manner.

With the direct object of finding a cure for the condition it was decided to try the effect of new forms of treatment, and in order to test the results obtained it was found necessary to make daily examinations of the urine, stools and blood. Since January 27th, when this investigation commenced, some 350 examinations have been made.

Each of these examinations has extended over several days and has required prolonged attention by trained experts. It became necessary to obtain assistance in the carrying out of the various processes, and I have been fortunate in securing the interest and help of the University Demonstrator in Pathology, Dr. Emrys-Roberts, while the clinical details have been carefully supervised by Dr. James Fletcher, the Resident Medical Officer at Ham Green.

At the present stage of the investigations, the following preliminary statements may be made. From January 27th to April 29th a certain treatment was adopted. During that period the number of typhoid bacilli in the urine and stools gradually diminished and then disappeared, but the condition of the blood was not much affected. On April 30th, therefore, another treatment was commenced. This has been associated with an improvement in the blood changes, but the abnormal signs have not yet entirely vanished. We have therefore to face the following problem. Have we succeeded in removing entirely the bacilli from the system of the patient, or are there still a remaining few which may increase and cause trouble at a later date ? The only means of answering these questions is to continue the daily examinations of the stools, urine and blood for a prolonged period, say for another twelve months. If at the end of this time the patient has not passed any typhoid bacilli we may be able to say that she will not further infect other people. During such time, however, so long as the daily examinations are continued, we see no reason why the patient should not do some work in the Institution, provided that she can be again put into a ward if the organisms reappear in the excretions, that she does not prepare, or serve up, food, and that she is willing to carry out any additional precautions we may find it necessary to prescribe.

In the following table are set forth the abbreviated results of the investigations.

Date.	Total number of Typhoid bacilli in Urine.	Presence of Typhoid bacilli in Stools.	Power of blood to kill bacilli.	Remarks.
1909.				
Jan. 5	Large numbers	Large numbers	1 : 1000	Treatment No. 1 commenced
,, 27	—	—	—	
,, 28	—	—	—	
,, 29	—	—	—	
,, 30	—	—	—	
,, 31	—	—	—	
Feb. 1	—	—	—	
,, 2	—	—	—	
,, 3	—	—	—	
,, 4	—	—	—	
,, 5	—	—	1 : 1000	
,, 6	—	—	—	
,, 7	—	—	—	
,, 8	—	Large numbers	—	
,, 9	—	Large numbers	—	
,, 10	—	Large numbers	1 : 1000	
,, 11	—	—	—	
,, 12	—	—	—	
,, 13	—	Large numbers	1 : 1000	
,, 14	—	Large numbers	1 : 500	
,, 15	—	—	—	
,, 16	—	—	—	
,, 17	—	Large numbers	—	
,, 18	—	—	—	
,, 19	—	Large numbers	—	
,, 20	—	Large numbers	—	
,, 21	109,132,800	—	—	
,, 22	—	—	—	
,, 23	—	—	—	
,, 24	—	—	—	
,, 25	—	—	—	
,, 26	—	—	—	
,, 27	—	—	—	
,, 28	—	—	—	
Mar 1	—	—	—	
,, 2	1,068,591	—	—	
,, 3	—	—	—	
,, 4	140,679	—	—	
,, 5	2,561,337	—	—	
,, 6	71,722	Few bacilli	—	
,, 7	—	Few bacilli	—	
,, 8	76,734	—	—	
,, 9	126,310	—	—	
,, 10	39,230	—	—	
,, 11	2,557	—	1 : 500	
,, 12	103,869	—	—	
,, 13	1,325	—	—	
,, 14	—	—	—	
,, 15	—	—	—	
,, 16	4,774	—	—	
,, 17	211,660	—	—	
,, 18	29,445	—	—	
,, 19	2,556	—	—	
,, 20	3,410	Few bacilli	—	

(— Means no bacilli present).

Date.	Total number of Typhoid bacilli in Urine.	Presence of Typhoid bacilli in Stools.	Power of blood to kill bacilli.	Remarks.
1909				
Mar. 21	—	—	—	Treatment No. 2 commenced
,, 22	—	—	—	
,, 23	—	—	—	
,, 24	—	—	—	
,, 25	—	—	—	
,, 26	—	—	—	
,, 27	—	—	—	
,, 28	—	—	—	
,, 29	—	—	—	
,, 30	—	—	—	
,, 31	—	—	—	
April 1	—	—	—	
,, 2	—	—	—	
,, 3	—	—	—	
,, 4	—	—	—	
,, 5	—	—	—	
,, 6	—	—	—	
,, 7	—	—	—	
,, 8	—	—	—	
,, 9	—	—	—	
,, 10	—	—	—	
,, 11	—	—	—	
,, 12	—	—	—	
,, 13	170,520	—	—	
,, 14	—	—	—	
,, 15	—	—	—	
,, 16	—	—	—	
,, 17	—	—	—	
,, 18	—	—	—	
,, 19	—	—	1 : 500	
,, 20	—	—	—	
,, 21	—	—	—	
,, 22	—	—	—	
,, 23	—	—	—	
,, 24	—	—	—	
,, 25	—	—	—	
,, 26	—	—	—	
,, 27	—	—	—	
,, 28	—	—	—	
,, 29	—	—	—	
,, 30	—	—	—	
May 1	—	—	—	
,, 2	—	—	—	
,, 3	—	—	—	
,, 4	—	—	—	
,, 5	—	—	—	
,, 6	—	—	—	
,, 7	—	—	—	
,, 8	—	—	—	
,, 9	—	—	—	
,, 10	—	—	1 : 500	
,, 11	—	—	—	
,, 12	—	—	1 : 500	
,, 13	—	—	—	

(— Means no bacilli present).

Date.	Total number of Typhoid bacilli in Urine.	Presence of Typhoid bacilli in Stools.	Power of blood to kill bacilli.	Remarks.
1909				
May 14	—	—	—	
,, 15	—	—	—	
,, 16	—	—	—	
,, 17	—	—	—	
,, 18	—	—	—	
,, 19	—	—	—	
,, 20	—	—	—	
,, 21	—	—	—	
,, 22	—	—	—	
,, 23	—	—	—	
,, 24	—	—	—	
,, 25	—	—	—	
,, 26	—	—	—	
,, 27	—	—	—	
,, 28	—	—	—	
,, 29	—	—	—	
,, 30	—	—	—	
,, 31	—	—	—	
June 1	—	—	—	
,, 2	—	—	—	
,, 3	—	—	—	
,, 4	—	—	—	
,, 5	—	—	1 : 800	
,, 6	—	—	1 : 250	
,, 7	—	—	1 : 200	
,, 8	—	—	1 : 125	
,, 9	—	—	—	
,, 10	—	—	—	
,, 11	—	—	1 : 50	
,, 12	—	—	1 : 125	
,, 13	—	—	1 : 25	
,, 14	—	—	1 : 25	
,, 15	—	—	—	
,, 16	—	—	—	
,, 17	—	—	—	
,, 18	—	—	—	
,, 19	—	—	—	
,, 20	—	—	—	
,, 21	—	—	—	
,, 22	—	—	—	
,, 23	—	—	—	
,, 24	—	—	—	
,, 25	—	—	—	
,, 26	—	—	—	
,, 27	—	—	—	
,, 28	—	—	—	
,, 29	—	—	—	
,, 30	—	—	—	

(— Means no bacilli present).

The several examinations of the urine, stools, and blood are being continued during July.

I. WALKER HALL.

July 5th, 1909.

To the Health Committee of the Bristol Corporation

Third Interim Report of the Investigation upon "Typhoid Carriers" by the Bristol University Public Health Laboratory.

The second interim report dealt with the case of Miss L. C., who had caused Typhoid Fever in eight individuals during the years 1905 to 1909, and covered the period from January 5th to June 30th, 1909. It was stated there that about 109 millions typhoid baeilli were found in the urine daily up to the middle of February. The numbers then gradually decreased to three millions on March 20th. The last date on which typhoid bacilli appeared in the urine was April 13th. The power of the blood to clump the typhoid bacilli gradually decreased. During this period, a certain treatment had been carried out and it was hoped that it would prove effectual in permanently removing the bacilli from the patient's body.

Since the date of the last report, the stools and the urine have been examined daily and the clumping power of the blood has been estimated periodically. A new form of treatment namely, the injection of dead baeilli into the patient's tissues, has been carried out with a view to prevent the recurrence of symptoms.

The disappearing of the typhoid bacilli from the urine was followed by the appearance of the colon-bacillus, an organism normally present in the large bowel. As the presence of this baeterium in the bladder was fraught with danger, treatment was then directed towards its removal. It persisted, though in decreasing numbers, until December 30th, 1909.

During the autumn, the continued absence of typhoid bacilli from the urine suggested the probable healing of the condition. The patient herself improved in general

health, and was free from the pains and malaise previously experienced. It seemed, therefore, that a stage of safety had been reached. Anxious, however, to make the recovery complete, and in order to avert the possibility of any relapse, it was determined to prolong the investigation until the end of March, 1910. This seemed the more necessary, since it is evident that some of the cases elsewhere concurrently examined have yielded insufficient and unsatisfactory results by reason of the less prolonged and less exhaustive series of examinations. The patient cheerfully assented to this course. Unfortunately our fears have been justified, for on January 4th, 1910, a few typhoid bacilli appeared among the colon-bacilli, and on January 12th the colon-bacillus disappeared entirely, while the urine yielded a pure culture of typhoid bacilli. The numbers averaged from 800 thousand to 1,600,000 per cubic centimetre. Onwards from March, 1909, the examinations of the blood showed that the condition of the body gradually improved, but signs of the need for a definite fight against an invading organism became apparent in December, and the resistance reached a very high level on January 20th, indicating that the typhoid bacilli were actively working in the patient's tissues.

The examinations of the stools indicate that in the case of Miss L. C., we may safely exclude an infection of the bowels by typhoid bacilli. The organisms are voided by the urine, and are therefore probably associated with some permanent collections in the kidneys or bony skeleton.

The following problems must now be faced. The attack during the Spring of 1909 ceased, but a number of typhoid bacilli must have been left behind in the body. These have now developed to such an extent that their excretion from the body has become necessary. The trouble

must again be dealt with by further treatment and examinations in the hope of a more satisfactory cure.

It is perhaps unnecessary to relate the various expedients which have been hitherto resorted to ; success in treatment depends to a great extent upon the condition of the patient and the virulence of the microbe. At one period of this investigation a large number of experiments were undertaken in an endeavour to raise the powers of certain strains of lactic acid bacilli internally. The typhoid bacilli obtained from the urine of Miss L. C. resisted successfully the attacks of all the available strains of lactic acid bacilli ; hence, experiments must be extended in other directions in order to deal more effectively with this particular type of bacillus.

The patient, Miss L. C., has taken a very intelligent interest in the investigations, and has practised carefully the measures considered necessary to minimise the dangers of transmitting the disease.

Recent observations show that the typhoid carrier plays a large part in the production of local epidemics of Typhoid Fever. Whether the stools or the urine contaminate water, milk, or dust, the human agent is the principal factor in conveying the infection, since the typhoid bacillus dies out rapidly when removed from human tissues. The Committee, therefore, is to be congratulated upon the attainment of the important piece of evidence contained in this report. Turning aside, however, for the moment, from the case of this particular carrier, the Committee will no doubt perceive the importance of ascertaining whether or not each person recovering from an attack of Typhoid Fever is a carrier. The Committee will probably be able to devise some means by which each case of Typhoid Fever occurring in its area of administration is subject to bacteriological examinations for certain prescribed periods after the

patient is allowed to leave his bed. With such a line of action, the Committee will be following the idea of prevention of disease—a course which is often easier than its cure, and certainly less costly than the nursing of patients and the disinfection of infected premises.

As regards the carrier L. C. at present in Ham Green Hospital there seems no other way than to continue the examinations with a view to a cure of the condition, and to report thereon to the Committee as soon as possible.

J. WALKER HALL, M.D.,
Professor of Pathology and Bacteriology.

REPORT OF THE ARMY MEDICAL DEPARTMENT FOR 1908.

Special attention has been directed in India to the question of food-contamination by "Chronic Typhoid Carriers" in the Army.

In every suspicious case the blood is examined for agglutinins, but Widal's reaction alone is no sufficient evidence that a man is a "carrier."

The urine and stools have been bacteriologically examined in a number of instances. A regimental soldier cook who had Typhoid Fever in 1896, was found to be intermittently excreting typhoid bacilli in his urine twelve years later, but no case of Typhoid Fever occurred amongst the men whose food he cooked. It is generally conceded that about three per cent. of all convalescents from Typhoid Fever become "carriers," and of these 70-80 per cent. are women. In India some 1,000 cases of Typhoid Fever occur annually amongst British troops; of these about 200 end fatally and about 50 are invalided to England; of the 750 left in India it may be assumed that about 23 become "carriers." But as only some

three or four per cent. of soldiers have to do with the cooking or preparation of food for their comrades, not more than one or two "carriers" can possibly be looked for as likely to be a source of contamination of food supplies in the cook-houses.

Convalescents from the Lahore, Mhow, Meerut, and Lucknow divisions are sent to Naini Tal, an isolated depôt with a divisional laboratory in charge of a bacteriologist, and provided with proper means for disinfection of clothing and sterilisation of excreta. 310 convalescents were received here in 1908; 1,472 examinations of fæces and 1,448 of urine were made. The urine and fæces of each man are examined for about seven consecutive days and no convalescent patient is sent back to his station within four months of the cessation of his fever.

Most convalescents cease to pass bacilli in their urine within a few weeks of convalescence.

Of 190 men whose excreta were examined, six were found to be still passing bacilli (five in the fæces and one in the urine) for more than six months after the cessation of fever; *i.e.* 3·1 per cent. of the convalescents. These men were invalided to England, and were still excreting bacilli after 18, 16, 12, 8, 6 and 6 months respectively.

The admissions from Typhoid Fever from all stations in 1908 which sent convalescents to Naini Tal show a reduction of nine per cent. on the figures for 1907, while the remaining stations show an increase of 26·6 per cent. so the work done here has apparently proved beneficial. A similar convalescent depôt for Southern India has been established at Wellington in Madras.

At other stations five chronic carriers, two of whom were women, were discovered, and also an acute (temporary) carrier, who was a nursing orderly.

At a conference of Sanitary Officers held at Poona it was recommended that all soldiers found to be "typhoid carriers" should be strictly segregated, and, if the condition was found to be chronic that they should be invalided out of the service.

Army—Second Report by the Director General A.M.S. on the Transmission of Enteric Fever by the "Chronic Carrier," 1909.

During 1908-1909 typhoid carrier cases were invalided home from Naini Tal, and the Army Medical Advisory Board took up the treatment of these carriers, and recommended that some cases should be treated by specific vaccines, each prepared from the strain of B. Typhosus excreted by the particular patient, and other cases by lactic acid bacilli. Treatment has also been attempted by the administration of intestinal antiseptics, by raising the acidity in the urine, and by exposure to X rays.

Full details of the treatment adopted in individual cases are given in this report; the general results, while hopeful in some instances, are generally inconclusive; and the known tendency to intermission in extrusion of bacilli renders prolonged observation necessary before a case can be definitely stated to be cured.

The following observations on the probable reasons why the treatment adopted has not proved effective are worth quoting:—

> "In order to kill the typhoid bacillus it is essential that the agents employed—no matter whether phagocytes, opsonins, bacteriolysins, lactic acid toxines, or chemical agents—shall be brought into intimate contact with the micro-organism to be destroyed. Now from the examination of a fatal case of Enteric Fever recently made by Dr. Josef

Koch, it appears that in certain cases the gall bladder is thickened and filled with papillomatous processes containing homogeneous masses surrounded by necrotic areas. The necrotic areas sometimes extended through the whole thickness of the papillæ, finally bursting and emptying their contents into the interior of the gall-bladder. The homogeneous masses thus extruded into the gall-bladder were found to be collections of typhoid bacilli, the toxines of which had killed the surrounding tissues. We do not yet know whether similar changes occur in the typhoid carrier, but it is extremely probable that they do, and that the bacilli in the gall-bladder, urinary passages, and intestinal wall are surrounded by areas of dead tissue through which no curative agent can penetrate. It follows, therefore, that no cure can result in such cases until all the contents of the necrotic areas have been discharged, which may be the work of years. It is also plain that if the "typhoid carrier" is to have a speedy cure, he must be detected before these chronic changes have been produced in his tissues. Consequent on the installation of the depôts at Naini Tal, and elsewhere in India, the convalescents from Enteric Fever are examined soon after the cessation of the fever, and from this policy will result an early diagnosis of the carrier condition, which cannot fail to be of benefit not only to the individual but to the state."

Practical Aspects of the "Carrier" Question.

Accepting the percentage of three carriers amongst all convalescents from Typhoid Fever; as there were 2,578 recoveries from Typhoid Fever in Bristol during the 20 years 1890-1909, this would imply an annual output of about three or four carriers, or a total of 77 scattered amongst the community.

There is probably little of risk of infection from a "carrier" of cleanly habits not engaged in food preparation, as for example the case of the medical practitioner shown by Dean* to be a carrier for 29 years.

But if the "carrier" is a cook or a housewife engaged in food preparation, the possibility of mischief is much increased, as shown by the Brentry instance where between 1904 and 1907, one woman was apparently causally connected with 53 cases and four deaths. The kind of danger from the "carrier" housewife is shown by the example quoted where four out of five children in a household simultaneously developed Typhoid Fever.

And the constant presence in a community of even a few "carriers" means an ever-present risk, only awaiting special opportunity to develop a wide-spread milk or water-carried outbreak; when or where is purely a matter of chance.

A "chronic typhoid carrier" does not come under any restrictive clauses of the Public Health Acts in England. It is true that a "carrier" cook in America was forcibly quarantined for three years, but she has lately been released, uncured, on undertaking not to follow the profession of a cook; but in England there is no power of quarantine.

It does seem necessary, in the interest not only of the community but of the patient, that the procedure in civil life should follow that adopted in the Army in India; for if cure is possible it is far more likely to be secured when the case is taken in hand at once, as soon as the condition is recognised, than it is after the profound degenerative changes already described have occurred; and it is obviously to the patient's interest to secure a speedy recognition of the condition with a view to cure, and to avoid the terrible disabilities incurred by "carriers"

* **British Medical Journal,** Mar. 7th, 1908, page 512.

when their condition becomes known. No less it is in the public interest that persons who are "carriers" should be definitely known, and, even if not cured, may be warned and trained to prevent themselves becoming a source of disaster to others.

In the absence of legal powers, this can only be secured by voluntary co-operation between Medical Attendants, Patients and the Public Health Authority.

In 1909 the following Rules from a paper* by Professor Walker Hall and myself, were distributed to Hospital Physicians and private practitioners; and I hope to arrange for registration of persons recovered from Typhoid Fever, with the view of keeping them under observation.

Instructions to Typhoid Convalescents.†

(To be handed to patients when discharged from Hospital).

Typhoid Fever is caused by a germ (the typhoid bacillus) which enters the body in food or drink or swallowed dust. When the convalescent stage is reached, the germ may remain in the intestines, and cause relapses of the disease. Sometimes the germ remains permanently in the intestines, and may cause a return of the disease many years after the first attack. The germ may also induce the formation of gall-stones. Thus it is evident that the contents of the intestine of the typhoid convalescent are infective, and that the convalescent may be the unconscious means of transmitting the disease to his, or her, own family or friends. Cooks, male or female,

* The "Effective" Periods of Typhoid Carriers (**The Lancet**, Nov. 28th, 1908.)

†From The "Effective Periods" of Typhoid "Carriers" by D. S. Davies, M.D., and I. Walker Hall, M.D., (**Lancet**, November 28th, 1908).

dairymen or dairywomen, milk-vendors, greengrocers, butchers, fishmongers, provision dealers, workers in cocoa, chocolate, or confectionery, waiters and waitresses, and the mother who prepares food for the family, form a class of convalescents in which the opportunity of transmission of the disease are very frequent. The following provisional rules are suggested with a view to diminish the risk of infection :—

1. The hands and nails should be thoroughly washed, first in disinfectant solution, then in soap and water, and well rinsed before touching any food stuffs, especially milk.

2. After the bowels are opened or the bladder is emptied the hands and nails should be at once disinfected and washed.

3. Strong disinfecting solution should be poured over the stools, etc., before the plug of the water closet is used or the lid of the dry closet is shut down.

4. When the motions are loose the risk of infection is increased and additional care should be taken.

5. The convalescent should periodically visit the medical attendant, so that the blood, etc., may be tested, and measures may be taken to control the action of the germs. As there is generally no need to deal with the drains, or to disinfect rooms or houses for these special cases, no upset of the domestic arrangements is necessary.

6. In the household where a patient is convalescing from Typhoid Fever the additional precautions of boiling all the milk or water used for drinking or in the preparation of food should be undertaken, and uncooked foods should be avoided.

Diphtheria—(including Membranous Croup).

During the 52 weeks of 1909, 712 cases were notified as Diphtheria, including 14 notified as Membranous Croup.

The number of deaths returned as due to Diphtheria was 55, including 3 deaths returned as due to Membranous Croup, giving a case mortality of 7·7 per cent. The case mortality observed in 1894 was 39 per cent.; much of this difference is apparent only, as large numbers of very mild cases, which in 1894 would have escaped observation, are sought for now by systematic bacteriological examination; this causes the figures as to case-mortality to be somewhat misleading. But the case-mortality of the years 1901-2-3 may more properly be compared with that for this year, and the diminution indicates, as I believe, the joint effect of decline in the virulence of the infection since these years of chief prevalence, and immunisation of the susceptible population through the wide diffusion of attenuated forms of the bacillus.

The 55 deaths from Diphtheria and Membranous Croup correspond to a death-rate from these causes of 14 per 100,000 living, compared with a rate of 18 in 1908 and 1907, 22 in 1906, 16 in 1905, of 30 in 1904, of 35 in 1903, and of 54 in 1902.

The Diphtheria rate (including Membranous Croup) for the 76 great towns in 1909 was 0·15.

Diphtheria (including Membranous Croup) for 20 years.

	1	2	3	4	5
Years	Cases Notified	Attacks per 100,000 Living	Deaths	Deaths per 100,000 Living	Case Mortality per Cent.
1890*2	56	25	16	7	28·5
1891	70	31	16	7	22·8
1892	106	47	38	16	35·8
1893	141	59	53	23	37·5
1894	128	56	50	22	39·0
1895	165	69	34	14	20·6
1896	258	111	38	16	14·7
1897	205	88	36	15	24·7
1898*	217	68	44	13	20·2
1899	215	67	33	10	15 3
1900	512	157	103	31	21·1
1901	908	275	124	37	13·6
1902	1,109	325	189	54	17·0
1903	1,134	331	119	35	10·4
1904‡	1,051	305	105	30	9·9
1905	1,021	284	59	16	5·7
1906	839	231	82	22	9·7
1907	926	251	68	18	7·3
1908	924	243	69	18	7·4
1909	712	188	55	14	7·7

* Enlarged City. ‡ City again extended in 1904.

*2 Notification commenced February 12th, 1890.

Diphtheria—Showing incidence of Cases and Deaths on the Sub-Districts of Bristol, 1909.

Incidence Rate per 100,000 Population.	Cases.	Registration Sub-District. — Population.	Deaths.	Death Rate per 100,000 Population.
165·6	79	Ashley 47,702	6	12·5
194·4	139	Bedminster 71,469	9	12·5
192·1	71	Bristol Central 38,165	5	13·5
180·1	82	Clifton 44,573	7	15·3
134·6	24	Knowle 17,828	1	5·6
177·2	127	S. George 71,501	12	16·7
126·7	61	S. Philip 47,999	8	16·6
226·2	61	Stapleton 26,961	5	18·5
192·2	22	Westbury-on-Trym 11,444	1	8·7
—	39	Arising in Municipal Institutions	—	—
—	7	Not belonging to Boro'	1	—
188·5	712	**City** 377,642	55	14·5

Diphtheria—Notifications in each Quarter in the Sub-Districts of Bristol, 1909.

	1st Qr.	2nd Qr.	3rd Qr.	4th Qr.	Year.
Ashley	22	16	15	26	79
Bedminster	29	34	34	42	139
Bristol Central	17	19	14	21	71
Clifton	21	21	20	20	82
Knowle	9	5	5	5	24
S. George	33	28	32	34	127
S. Philip	9	13	17	22	61
Stapleton	21	13	11	16	61
Westbury-on-Trym ..	2	2	2	16	22
Arising in Municipal Institutions	13	9	8	9	39
Not belonging to Boro'	1	4	1	1	7
City	177	164	159	212	712

The Health Committee during the year have supplied 286,000 units of Diphtheria antitoxin free to Medical Practitioners upon application, for 64 patients whose parents were certified as unable to afford to pay for this.

Laboratory Examinations in Diphtheria and Enteric Fever.

	Diphtheria.	Enteric Fever.	Total.
1895	87	—	87
1896	206	—	206
1897*	379	254	633
1898	390	127	517
1899	485	290	775
1900	915	452	1,367
1901	2,527	425	2,952
1902	3,771	420	4,191
1903	5,545	240	5,785
1904*2	6,858	308	7,166
1905	6,469	161	6,630
1906	4,738	219	4,957
1907	6,549	166	6,715
1908	5,003	172	5,175
1909	4,118	138	4,256

* City enlarged in November, 1897.
*2 City enlarged in October, 1904.

In November, 1902, this work, which had for seven years been voluntarily undertaken by the Medical Officer of Health, was transferred to University College, Bristol; and in 1906 was transferred to the City Analyst.

Of the 4,256 bacteriological examinations made during 1909, 2,079 were of suspected cases of Diphtheria, of which a positive result was obtained in 548, 755 showed suspicious organisms, and 776 gave a negative result; 2,039 control examinations to determine recovery, of which a positive result was obtained in 704, 646 showed suspicious organisms, and 689 gave a negative result, and 138 were of suspected cases of Enteric Fever, of which a positive result was obtained in 28.

Diphtheria in 1909.

Barnard's Place Infants' School.—Information was received about the middle of October from the School Medical Officer of two children attending this School, excluded for suspicious Diphtheria, and cultures sent in from these children gave a free growth of Diphtheria in the Nose. One other case of Diphtheria had been notified of a child attending this school.

A special examination of the children in school was therefore instituted and two visits were paid on 26th and 28th October by an Assistant Medical Officer of Health.

Special attention was given to the class attended by the two children excluded by the School Medical Officer and of the 35 children present at the time of visiting, 30 were examined, and of these nine were found by bacteriological examination to be carrying Diphtheria bacilli in throat or nose, and 20 to be harbouring suspicious organisms.

Attention was next paid to the brothers and sisters of these children who were attending the upper departments of the School, with the result that one was found to be carrying Diphtheria bacilli and three were harbouring suspicious organisms.

A selection of the worst cases of those who were harbouring the suspicious organisms was made and they

were treated as out-patients at St. Philip's Marsh Hospital, which was opened for the purpose. One of these cases was subsequently found to be carrying the Diphtheria bacillus and was removed to Hospital.

The result of this examination and exclusion was that no further cases were notified up to the end of the year amongst children attending this School.

Shirehampton School and Avonmouth School.—During October a group of cases of Diphtheria was reported amongst children attending the Shirehampton and Avonmouth Schools, six cases at the former and three at the latter School.

A special medical examination by an Assistant Medical Officer of Health of the scholars attending the Shirehampton School was instituted on 27th October, and in the same class in which three cases of Diphtheria had occurred 21 of the 46 children present at the time of visiting, were swabbed, and of these two were found to be carrying the Diphtheria bacillus in throat or nose, and seven were harbouring suspicious organisms. In another class four children were swabbed who sat next to a child notified as suffering from Diphtheria, two of these were found to be carrying Diphtheria, and the other two were harbouring suspicious organisms.

The worst cases of those who were harbouring the suspicious organisms were excluded from school and the parents advised to secure local treatment.

Only one other case of Diphtheria was notified amongst children attending this school from this date up to the end of the year.

Baptist Mills School.—A further group of cases of Diphtheria amongst children attending Baptist Mills School was noticed. In November two cases were notified,

one of these ended fatally, and between the 7th and 17th of December four further cases were reported.

A special medical inspection of the scholars attending this school was made by an Assistant Medical Officer of Health on 21st December and in one class where there had been three cases notified 15 children were swabbed, three of these upon examination were found to be carrying the Diphtheria bacillus and 12 to be harbouring suspicious organisms. The children in the classes attended by the three other cases were examined, and swabbings taken from 19; one was found to be carrying Diphtheria and 18 to be harbouring suspicious organisms. No further cases were reported from this school.

Comparative Table showing Diphtheria Mortality.

(*From the Registrar General's Annual Summary.*)

	Death Rates from Diphtheria per 100,000 Living.										
	10 years' Average 1890-99.	5 years' Average 1904-08	1901	1902	1903	1904	1905	1906	1907	1908	1909
*76 Towns ..	—	17	—	26	20	19	16	19	17	16	15
33 Towns ..	33	—	30	—	—	—	—	—	—	—	—
London	49	15	29	25	16	16	12	15	16	15	13
West Ham	51	22	62	46	26	15	26	29	24	17	13
Croydon	29	22	16	21	12	17	16	27	27	24	15
Brighton	20	9	51	28	26	12	4	9	12	7	15
Portsmouth ..	23	30	37	34	39	36	34	29	29	23	31
Plymouth	13	14	11	13	13	12	15	18	13	12	15
Bristol	**14**	**20**	**37**	**54**	**35**	**30**	**16**	**21**	**17**	**17**	**14**
Cardiff	40	12	46	52	20	18	13	7	12	11	7
Swansea	33	14	18	25	22	25	20	7	12	4	6
Wolverhampton	35	23	12	20	9	18	18	23	26	30	11
Birmingham ..	24	19	16	24	26	24	17	18	18	19	16
Norwich	21	22	26	9	11	7	20	25	38	21	15
Leicester	27	6	71	15	13	3	5	13	7	3	6
Nottingham ..	8	18	12	12	26	28	19	16	16	11	10
Derby	11	33	19	10	3	25	19	50	42	28	26
Birkenhead	23	21	25	24	10	24	28	23	20	11	15
Liverpool	20	20	27	30	23	27	21	20	15	17	15
Bolton	10	12	16	25	21	16	10	12	12	10	9
Manchester	21	18	24	21	24	17	20	19	16	18	17
Salford	34	41	63	33	38	49	36	39	31	51	44
Oldham	15	15	9	33	39	25	9	12	13	15	10
Burnley	26	14	40	45	20	12	19	14	14	12	14
Blackburn	12	15	49	17	20	8	24	19	13	9	15
Preston	12	14	15	24	18	20	16	14	10	9	9
Huddersfield ..	13	11	6	13	15	15	11	14	8	9	21
Halifax	15	24	17	8	9	16	26	39	26	11	24
Bradford	8	27	11	30	19	57	28	21	15	14	17
Leeds	23	12	40	21	15	10	10	18	14	9	13
Sheffield	29	13	64	27	9	11	13	19	12	8	8
Hull	12	30	17	35	31	25	30	52	25	18	23
Sunderland	7	21	20	10	21	18	20	22	27	17	20
Gateshead	13	20	11	10	10	12	16	28	25	20	12
Newcastle	18	19	51	10	17	22	19	24	19	12	19

* The Registrar General now gives the rates for 76 of the large towns, and these rates are no longer comparable with the previously given rates for the 33 largest towns.

Cholera—Choleraic Diarrhœa—Plague.

No suspicious cases were introduced.

Diarrhœa—Infantile Diarrhœa.

The number of deaths returned as due to Diarrhœal diseases during the year was 116 compared with 154, 133, 213, 169, 206, 107, 165, and 345 fatal cases recorded in the previous eight years. Of the 116 deaths, 101 occurred in children under one year of age, 11 at ages one to five, one between the ages of 25 and 65, and three in persons aged 65 and upwards. These deaths give a Diarrhœa death-rate of 0·30 per 1,000 living.

Comparative Table showing Diarrhœa Mortality.

(*From the Registrar General's Annual Summary*).

	Death Rates from Diarrhœa per 100,000 living.									
	10 years' Average 1890-99.	5 years' Average. 1904-1908.	1902	1903	1904	1905	1906	1907	1908	1909
*76 Towns.	—	85	54	71	120	83	116	40	65	38
33 Towns.	96	—	—	—	—	—	—	—	—	—
London	74	71	54	64	104	73	94	32	53	33
West Ham...	89	144	85	111	208	159	188	66	100	65
Croydon	59	50	49	28	64	33	96	42	31	12
Brighton	81	38	39	40	43	37	55	33	22	21
Portsmouth .	95	72	80	59	108	86	111	29	26	25
Plymouth ...	73	67	45	49	102	80	72	34	48	31
Bristol	**63**	**41**	**38**	**28**	**51**	**36**	**54**	**32**	**34**	**27**
Cardiff	87	56	27	46	72	32	79	34	63	32
Swansea	42	67	49	48	77	46	82	52	78	84
Wolv'rh'mpt'n	137	104	78	90	165	128	132	49	44	29
Birmingham	123	108	71	111	176	83	158	43	80	45
Norwich	100	95	63	75	118	119	155	46	39	41
Leicester	152	84	59	60	131	93	113	31	50	43
Nottingham .	111	98	72	68	137	76	152	63	64	69
Derby	76	47	42	38	68	61	53	20	34	26
Birkenhead .	83	107	60	118	154	101	175	31	76	40
Liverpool ...	132	145	94	98	252	135	179	73	84	70
Bolton	138	88	39	90	94	105	115	41	85	33
Manchester .	129	109	53	89	137	115	153	50	92	43
Salford.....	154	115	64	98	166	121	144	44	98	50
Oldham	70	90	31	42	91	72	119	53	114	36
Burnley	134	153	59	140	201	137	201	69	159	58
Blackburn ..	131	73	40	52	81	64	107	28	85	35
Preston	211	124	144	103	143	132	196	54	97	33
Huddersfield	41	52	19	26	51	44	90	22	54	26
Halifax	32	25	21	16	34	25	30	18	16	12
Bradford ...	91	62	18	51	83	50	93	17	65	16
Leeds	109	76	60	63	99	79	97	38	67	23
Sheffield	135	129	56	127	135	152	171	99	87	55
Hull	145	134	41	125	208	128	161	37	136	57
Sunderland .	123	82	49	60	109	83	108	45	66	33
Gateshead ..	107	96	37	91	113	68	162	37	98	34
Newcastle-on-Tyne	73	54	26	58	51	58	103	14	46	20

* The Registrar General now gives the rates for 76 of the large towns, and these rates are no longer comparable with the previously given rates for the 33 largest towns.

Erysipelas.

During the year 1909, 199 cases of Erysipelas were notified, and three deaths were returned, compared with 223 cases and six deaths in 1908.

Puerperal Fever.

Thirty-six cases of Puerperal Fever were notified, compared with 22 last year. Seventeen cases proved fatal, compared with 23 in 1900, 17 in 1901, 17 in 1902, 14 in 1903, 16 in 1904, 6 in 1905, 14 in 1906, 11 in 1907, and 7 in 1908.

Typhus Fever.

No case of Typhus Fever was notified in the City during the year. This disease disappeared when Registration of Common Lodging Houses and control of gross insanitary conditions were taken in hand in the sixties and seventies of last century.

Measles.

The deaths from Measles in the City in 1909 numbered 90 compared with 96 in 1908, 36 in 1907, 140 in 1906, 180 in 1905, 94 in 1904, 11 in 1903, 411 in 1902, with 7 in 1901, with 200 in 1900, and 38 in 1899. These fluctuations are characteristic of Measles prevalence in large centres of population.

Of the 90 deaths, 85 occurred in children under 5, and five between the ages of 5 and 15.

In the first quarter of the year 15 deaths occurred, 36 in the second, 14 in the third and 25 in the fourth quarter.

The relative fatality for a period of 10 years in the City of Bristol from various diseases is here shown, and Measles is found to occupy a most prominent place amongst the causes of mortality.

	1900-1909 Deaths
Diarrhœa	1508
Measles	1265
Diphtheria	974
Whooping Cough	967
Scarlet Fever	340
Enteric Fever	260
Small-pox	15
Typhus Fever	0

Whooping Cough.

The deaths from Whooping Cough in the City numbered 56, compared with 128 in 1908, 35 in 1907, 102 in 1906, 123 in 1905, 110 in 1904, 65 in 1903, 105 in 1902, 189 in 1901, 54 in 1900, and 118 in 1899.

Thirty of the deaths occurred in children under one, 23 at the ages one to five, and three at ages five to fifteen.

In the first quarter of the year 25 deaths occurred, 17 in the second, 10 in the third, and four in the last quarter of the year.

The disease was most fatal in Bedminster (17), Bristol Central (12), S. George (7), and Ashley (6).

The mortality in this disease is largely due, as in the case of Measles, to the want of care exercised during the course of the illness to avoid exposure to inclement weather. It bears a similar relation to school attendance as in the case of Measles, and is very fatal at ages under five.

Influenza.

This disease was credited with 27 deaths during 1909, compared with 73 in 1908, 55 in 1907, 47 in 1906, 54 in 1905, 27 in 1904, 33 in 1903, 56 in 1902, 65 in 1901, 53 in 1900, and 119 in 1899.

Influenza was returned as a cause of death chiefly during the first quarter of the year, and the figures for the four quarters are 11, 6, 3, and 7 respectively.

Cerebro-Spinal Fever.

Four deaths were returned as due to this disease during the year.

EPIDEMIC JAUNDICE.

Dr. A. Fells contributed some interesting notes at a meeting of the Bristol Branch of the British Medical Association in October, 1909, on an epidemic form of Jaundice—occurring in Bristol in four children of one family, robust and healthy, and living under healthy conditions.

The first to sicken was a girl of ten, who, in November, 1908, complained of pain in the region of the liver, increased by standing or walking, and of complete loss of appetite. She vomited on one occasion only. Tongue coated, bowels constipated, and when moved by medicine, costive and greyish. Temperature only slightly above normal, never exceeding 100° F. During the second week, the urine contained much bile pigment, and the conjunctiva and skin became jaundiced.

Ten days after the girl, her brother, aged six, sickened in a similar way. He repeatedly vomited for two or three days, but otherwise his symptoms were less severe and his recovery more rapid, but there was distinct jaundice.

Five days after the boy, an elder brother, aged 15, developed similar symptoms. In his case, pain was more definitely located in the gall bladder region, and there was distinct tenderness on pressure. There was no vomiting, jaundice was well marked, the skin and urine remained deeply stained for two and a half weeks.

One day later, a sister, aged eight, followed suit, and in her case, the vomiting was frequent for the first 36 hours—otherwise symptoms were less severe—but there was distinct jaundice.

Each case taken by itself was apparently a simple and slight catarrhal Jaundice, but the sequence suggests an infectious process at work. In the two younger children, where vomiting was free, the disease was cut short, probably by free elimination of the poison.

Dr. Llewellyn F. Barber and Dr. Frank J. Sladen, in recording a small epidemic of Jaundice with symptoms of Gastro-Intestinal Catarrh * affecting six men out of 700 inmates in the Baltimore City Jail, point out that the occurrence of Jaundice with fever and gastro-intestinal disturbance in a number of people at the same time is by no means uncommon. Having † analysed 86 epidemics of this sort in 1890, and since then from 35 to 50 more have been added. The clinical types have varied from a simple Catarrhal Jaundice with fever to the most severe forms of Icterus with prostration, acute intoxication, nephritis, destruction of the liver and death. The condition is apparently not a septicæmia, but rather a local infection, either of the gastro-intestinal tract alone, or also of the tube passages and possibly sometimes of the liver. Our bacteriological knowledge of the disease depends upon examination of a few autopsies and is rather unsatisfactory.

In the outbreak recorded, three white and three coloured men were attacked in November-December, 1908, all aged from 21 to 29. The authors conclude that, although so few were attacked, the attacks were indisputably *epidemic*. The men were quartered within the same walls, but their cells were well separated; the first five men ate in the same dining room, but not at the same table.

* "John Hopkins Hospital Bulletin," No. 223, Oct., 1909 —Baltimore,
† "Hennig. A. Volkmann's Hefte," 1890, viii.

These cases all developed within 14 days, four of them within five days ; in an epidemic in Bremen the limits of incubation varied from a few days to several months.

Every man in the Baltimore jail drinks City water from the hydrants, that and food are the only articles in common. Three of the patients receive meat once a day, the other three have meat four times a week, otherwise the diet consists of soup and bread. No particular article of food could be definitely implicated, but the meat appeared to be the most open to suspicion, and in other similar epidemics contaminated meat has frequently been held responsible. Many meat poisonings appear to be gastro-enteritis due to the B. paratyphosus or its toxins ; it is surprising how often meat and sausage harbour the B. paratyphosus, the studies of Dahm * are especially instructive on this point ; but several different organisms may probably cause similar symptoms.

The only positive results of the bacteriological study in these cases suggest the B. paratyphosus as the invading micro-organism, which, already present in the intestinal tract of certain of the prisoners †—may have rapidly multiplied during a period of lowered resistance due to unknown causes ; or the bacillus may have been introduced with the food.

The authors regard the probable sequence of events to have been :—

1. Ingestion of tainted meat, containing living paratyphoid bacilli.
2. Development of a gastro-enteritis due to this micro-organism.
3. The appearance of a catarrhal jaundice due to extension of the gastro-enteritis to the biliary passages.

The paper contains a description of the clinical features of the cases, and a full bibliography.

* Dahm, "Zentralb. f. Bakteriol," 1903, Heft. i.

† Rimpau states that the B. paratyphosus is present in normal human fæces in 6 per cent. of the cases examined.

FOOD POISONING.

August, 1909.

On August 19th information was received from one of the Office Staff that he, his wife and several neighbours were all suffering from diarrhœa and other symptoms, and he understood that they all fell ill about the same time, and had all eaten corned beef purchased from the same shop. Enquiry was at once instituted, the results of which may be summarised as follows :—

House No.	Meat eaten.	Date of purchase.	Date of attack.	No in family.	No. who ate.	No. who ate attacked.	No. who ate that escaped.
1	Corned Beef	Aug. 13th	14th & 15th	5	4	4	—
2	,,	,, 14th	15th	4	4	4	—
3	,,	,, ,,	,,	14	9	9	—
4	,,	,, ,,	14th & 15th	5	4	4	—
5	,,	,, 12th	14th	8	4	1	3
6	,,	,, 14th	16th	4	3	2	1
7	,,	,, ,,	15th	7	7	7	—
8	,,	,, ,,	,,	7	5	3	2
9	,,	,, ,,	,,	6	4	3	1
10	,,	,, ,,	,,	6	4	3	1
11	,,	,, ,,	,,	3	2	2	—
12	,,	,, ,,	14th & 15th	6	4	4	—
13	,,	,, ,,	,,	5	4	4	—
14	,,	,, ,,	15th	7	7	4	3
			TOTALS ..	87	65	54	11

From the above it is seen that 54 persons out of 65 who ate the beef in question (or no less than 83·07 per cent.) suffered and there can be no reasonable doubt that the beef was the cause of the illness. The above cases are probably not by any means all that occurred, for the

amount of beef sold from 6th August to 14th August was 136 lbs., but they are all of which we have any information. This 136lbs. of beef was obtained in five cuts from two butchers, four cuts representing 115lbs. from one, and one cut 21lbs. from the other. The last piece was obtained on 10th August and had probably been killed six or seven days previous to pickling, and although this cut, as well as the other four, was stated by the butchers to present no unusual appearance, it is quite possible that it may have been the piece primarily at fault, and affected the other meat in the pickle with it. The general statement of the consumers was to the effect that there was no noticeable taste or smell about the meat but that it was rather pale and "mild"—that is, had not a pronounced "corney" taste. Unfortunately by the time enquiries were able to be set on foot none of the beef was procurable.

On first information of the outbreak the premises of the seller were visited and inspected, and found well conducted and clean. The whole of the pickle was destroyed as well as the wood tub in which the beef had been pickled. The slate pickling vat was washed with hot soda, sprayed with formalin, and again washed with soda. The floors and walls were also sprayed.

Some of the cases were very severe, but fortunately there has been no death recorded.

During the enquiry some reason was found to suspect pork bought at the same shop on the same date, 14th August. Three families were heard of, of which the following are the particulars :—

House No.	Meat eaten.	Date of purchase.	Date of attack.	No. in family.	No. who ate.	No. who ate attacked.	No. who ate that escaped.
1	Pickled Pork	Aug. 14th	Aug. 15th	9	5	5	—
2	,,	,,	,,	6	3	3	—
3	Roast Pork	,,	,,	7	3	3	—
			TOTALS ..	22	11	11	—

It is probable that the pickled pork was in the same pickle as the beef.

JOHN C. HEAVEN,
Acting M.O.H.

TUBERCULOSIS.

Phthisis (Pulmonary Consumption).

The fatality of Pulmonary Phthisis, and of other Tubercular Diseases, in comparison with that from the seven principal zymotic diseases is shown here for fifteen years.

	1895	1896	1897*	1898	1899	1900	1901	1902	1903	1904†	1905	1906	1907	1908	1909
Phthisis	317	370	302	393	430	415	401	415	366	413	407	404	384	397	391
Other Tubercular Diseases ...	136	129	136	178	180	145	139	162	154	144	152	137	114	140	133
Seven Principal Zymotics ...	268	435	430	851	582	606	530	942	375	578	583	585	314	467	350

* City enlarged in November, 1897.
† City enlarged in October, 1904.

In 1899 a systematic examination of the milk from all farms supplying the City was carried out by Professor Delépine, of Manchester. Out of 74 samples examined, only 4 showed the presence of Tuberculosis. The samples were taken from the milk as brought into the City for delivery.

All meat and milk contracts for the City and Port Hospitals are framed upon conditions protective against Tuberculosis.

The Bristol City Council, on the recommendation of the Health Committee, has made the following arrangements for dealing with consumption in the City :—

Winsley Sanatorium.—They have contributed a sum of £5,000 towards the erection and equipment of the Winsley Sanatorium, and a further sum of £1,300 annually towards the maintenance of 20 beds, to be reserved at their disposal (Resolution of Council of 13th May, 1902,

and 8th Dec., 1903). At a Meeting of the Council, on 26th March, 1907, it was resolved that an additional capital sum of £1,000 be contributed, together with an additional annual sum of £100. The Sanatorium was opened in the early part of December, 1904. The first Bristol case was admitted on 27th February, 1905.

The following particulars have been kindly supplied by the Clerk to the Guardians, with regard to *the arrangements made by the Guardians* for the care and treatment of cases of Phthisis.

At Southmead Workhouse, Westbury-on-Trym.—A temporary building of wood and iron, acquired by the late Barton Regis Rural District Council as an Isolation Hospital for Infectious cases, has been set apart for the adult male cases. This building accommodates 30 patients, and has by structural alterations been made suitable for the open-air treatment. It is quite isolated and surrounded by open land.

In the portion erected as an Infirmary, a permanent building of stone, accommodation is provided for women and children. This portion contains about 17 beds, and alterations have been made so as to make it as suitable as possible for the open-air treatment.

The foregoing accommodation only provides for a somewhat limited number of cases of Phthisis that become chargeable to the Guardians; cases that are believed to be capable of improvement by the open-air treatment being sent to Southmead.

At Stapleton and Eastville Workhouses.—In addition, the Guardians have a number of more chronic cases at these Workhouses, where they are kept as far as possible separate from the other inmates requiring sick treatment.

Notification.—In September, 1903, the Council approved of the initiation of a voluntary system of notification of Phthisis. Leaflets containing "Preeautions against Consumption" were distributed through the City, first by the S. John's Ambulanee Brigade, later by the Health Committee, and Sputum Flasks are supplied to deserving patients unable to afford the purehase; disinfecting solution for use in the flasks is also gratuitously supplied.

Year	1905*	1906	1907	1908
Males	196	347	291	275
Females	134	356	251	241
Total Notified	330	703	542	516

* Voluntary Notifications of Phthisis commenced September, 1905.

Enquiries and Disinfection.—Eaeh week the deaths from "Consumption" are singled out from the death returns and entered upon speeial enquiry eards. The District Inspectors visit, make enquiries in these, as well as in all notified eases not speeially exempted, and seeure disinfeetion of the rooms or premises, and of any articles that need it.

Examination of Phthisical Sputum.—The Bacteriologieal examination of Phthisieal Sputum is provided free of eost for Medieal Praetitioners in regard to City eases. 692 examinations were made during 1909, of whieh 205 gave positive results.

Notification 1909.

TABLE I. (Cases).

395 Cases were notified under the Voluntary System during the year 1909

173 „ „ under the Public Health (Tuberculosis) Regulations, 1908

568 Total number notified.

Forty-one of the Poor-Law Cases were previously notified under the Voluntary System—and are not included in these tables.

In 349 Cases, Disease was reported as Phthisis of Lungs.

„ 111 „ „ . limited to Right Lung.

„ 67 „ „ „ limited to Left Lung.

TABLE II. (Cases).

History Table showing Relatives Affected.

130 Cases, History of Phthisis in Family.

	Father.	Mother.	Husband.	Wife.	Brother.	Sister.	Son.	Daughter.	Uncle.	Aunt.	G.Father.	G.Mother.	Cousins.
Male Cases 57	19	8		2	21	10	3	2		3	1	1	1
Female Cases 73	19	15	5		15	12	5	2	6	8	5	1	4

In 38 Cases, history shows more than 2 Persons affeeted in Family.

TABLE III. (Cases).

Occupation of Notified Cases.

Occupation	Male.	Female	Total
Barber	1	—	1
Bakers	2	—	2
Bill Posters	2	—	2
Boot, Shoe, Leather	18	5	23
Builders, Masons, Quarrymen	3	—	3
Butchers	2	—	2
Caretakers	3	—	3
Clerks	17	6	23
Cocoa	3	—	3
Cotton, Clothing, Tailoring	9	23	32
Customs	1	—	1
Domestics	—	26	26
Drivers, etc.	7	—	7
Enameller	—	1	1
Engineering—Iron Workers, etc.	13	—	13
Fish	2	—	2
Gardener	1	—	1
Gas Worker	1	—	1
Glass Worker	1	—	1
Hawkers	4	1	5
Home	—	8	8
Housewives	—	131	131
Institutions	12	7	19
Insurance Agents, Canvassers	2	—	2
Joiners, Carpenters, Cabinet Makers	8	—	8
Labourers	92	—	92
Laundry	—	1	1
Messenger Boy	1	—	1
Miners	4	—	4
Missioner	1	—	1
Musicians	2	—	2
News Boys	2	—	2
No occupation	5	11	16
Painters	6	—	6
Paper, Printing, Stationery	11	11	22
Publicans, Barmen, etc.	2	2	4
Rag Pickers	—	2	2
Railway Worker	1	—	1
Reservists—Army, Navy	4	—	4
Rubber	—	1	1
Schools	8	6	14
Seamen	2	—	2
Shop Assistant	1	—	1
Stoker	1	—	1
Teachers	1	1	2
Tobacco, Cigar, Cigarette	9	9	18
Travellers	2	—	2
Undertaker	1	—	1
Unknown	—	1	1
Upholsterer	1	—	1
Waiters	2	—	2
Warehousemen	3	—	3
	274	253	527
	Previously Reported		41
			568

TABLE IV. (Cases).

Table Showing number of Persons in Affected House.

Persons in House	1	2	3	4	5	6	7	8	9	10	11 and over	
Cases ..	1	24	34	76	113	78	53	34	31	12	21	= 477
											Institutions ..	50
											Previously reported	41
												568

FAMILIES IN HOUSE.

Families in House	1	2	3	4	5	
Cases	340	110	18	7	2	= 477
					Institutions ..	50
					Previously reported	41
						568

ROOMS IN HOUSE.

Rooms in House	2	3	4	5	6	7	8	9	10	
Cases	6	11	36	65	265	34	37	8	15	= 477
								Institutions ..		50
								Previously reported		41
										568

CONDITION OF HOUSE AS TO "CLEANLINESS," "DAMPNESS, VENTILATION & REPAIR," & "DRAINAGE."

	Reported Good.	Reported Fair.	Reported Bad.	Institutions.	Previously Reported.	Totals.
Cleanliness	122	345	10	50	41	568
Dampness, Ventilation and Repair	113	356	8	50	41	568
Drainage	121	350	6	50	41	568

15 Notices were issued.

Houses classed as "good" or "fair," may be deemed satisfactory; no action was required in either group.

OVERCROWDING.

Case No. 2293 4 persons occupied 1 room.
Case No. 2148 6 persons occupied 2 Rooms.

TABLE V. (Cases).

Table showing number of persons in, and number of rooms occupied by patient's family.

Rooms per Family.	Persons in Family 1	2	3	4	5	6	7	8	9	10	11	12	14	
1	44	12	2	.	1	.	.	.	.	.	.	.	.	59
2	3	13	7	7	1	2	.	.	.	.	.	.	.	33
3	1	12	19	11	7	2	3	.	.	.	.	.	.	55
4	.	3	12	14	6	4	5	3	2	.	.	.	.	49
5	.	2	7	11	23	11	4	2	1	.	.	.	.	61
6	.	11	11	38	40	24	20	9	18	3	.	1	.	175
7	.	2	3	2	4	1	3	1	.	.	.	.	.	16
8 and over.		2	3	1	7	6	2	4	2	.	1	.	1	29
													=	477
													Institutions	50
													Cases notified during 1909 ..	527

TABLE VI. (Cases).

Common and Institution Lodging House Cases.

Notified in Common Lodging Houses...	12	Cases
Notified in Institution Lodging Houses	7	,,
Total number notified	19	,,
Admitted to Stapleton Workhouse	9	Cases
Admitted to Southmead Workhouse....	2	,,
Admitted to Eastville Workhouse	7	,,
Remaining in Common Lodging House	1	,,
	19	,,

Out-workers.

One Male and One Female Out-worker was notified :—
Male Out-worker engaged in Boot-making.
Female Out-worker engaged in Tailoring.

Milk.

497 Cases—Name of milkman reported.
56 ,, Obtained from casual sellers.
15 ,, Used Condensed Milk.
136 ,, Milk was boiled before use.

Animals Kept.

17 Cases—Kept Animals or domestic pets.

Disinfection, etc.

35 Cases—Clothing was disinfected.
132 ,, Bedding was disinfected.
224 ,, Rooms were disinfected.
253 ,, Refused. In many cases the people would like disinfection to be carried out but could not owing to state of health of patient.
255 ,, Laundry, etc., was done at home.

Sputum Flasks, etc.

29 Sputum Flasks were supplied.
687 Bottles of Disinfectant Solution were supplied.

Schools.

14 Cases attended the Elementary Day Schools.

TABLE VII. (DEATHS).

Enquiry into 391 Deaths returned from Phthisis.

289 Cases died at Home.
32 ,, ,, Stapleton Workhouse.
18 ,, ,, Eastville Workhouse.
13 ,, ,, Asylum.
20 ,, ,, Southmead Workhouse.
19 ,, Other Institutions.

391

Year of Notification of 391 Fatal Cases:—

8	Deaths	occurred	amongst	cases	notified in	1905
20	,,	,,	,,	,,	,,	1906
30	,,	,,	,,	,,	,,	1907
71	,,	,,	,,	,,	,,	1908
129	,,	,,	,,	,,	,,	1909
133	,,	,,	,,	,,	not notified.	
391						

TABLE VIII. (DEATHS).

Showing Occupations of 391 Fatal Cases.

Occupation.	Males.	Females.	Total.
Barber	1	—	1
Bakers	3	—	3
Boots, Shoes, Leather Workers	8	4	12
Bill Poster	1	—	1
Butcher	1	—	1
Canvassers, Agents	3	—	3
Caretaker	1	—	1
Clerks	19	4	23
Clothing	9	16	25
Coeoa	—	1	1
Cooper	1	—	1
Customs	1	—	1
Dispensers	3	—	3
Domestic Servants	—	6	6
Drivers of Horses	10	—	10
Gardeners	4	—	4
Gas Worker	1	—	1
Glass	1	—	1
Glue	—	1	1
Hawkers	1	1	2
Home	—	7	7
Housewives	—	88	88
Iron Workers, Engineers	12	—	12
Jeweller	1	—	1
Joiners, Carpenters, Wood Workers, etc	13	—	13
Labourers	42	—	42
Lamplighter	1	—	1
Masons	2	—	2
Miners—Pit Labourers	3	—	3
No Occupation	5	15	20
Navy, Army, Reservists	6	—	6
Nurses	—	3	3
Painters, Decorators, French Polishers	6	—	6
Paper, Printing, Stationery	10	8	18
Police	1	—	1
Post Office	1	—	1
Publicans, Barmen, etc.	10	1	11
Poulterer	1	—	1
Potter	1	—	1
Rag Sorter	—	1	1
Railwaymen	9	—	9
Rope	1	—	1
Rubber	—	1	1
Schools	1	10	11
Seamen	6	—	6
Shop Assistants	2	1	3
Stoker	1	—	1
Teacher	—	1	1
Travellers	6	—	6
Tobacco, Cigars, Cigarettes	3	6	9
Upholsterer	1	—	1
Waiter	1	—	1
Warehouse	2	—	2
	216	175	391

TABLE IX. (DEATHS).

Housing—Particulars of 391 Fatal Cases.

PERSONS IN AFFECTED HOUSE.

Persons in House	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Cases	18	38	54	38	42	33	31	12	11	3	2	3	3	1	= 289
														Institutions	102
															391

FAMILIES IN HOUSE.

Families in House	1	2	3	4	
Cases	202	66	14	7 =	289
			Institutions		102
					391

CONDITION OF HOUSE AS TO "CLEANLINESS," "DAMPNESS, VENTILATION AND REPAIR," AND "DRAINAGE."

	Reported Good.	Reported Fairly Good.	Reported Bad.	Total.
Cleanliness	87	192	10	289
Dampness, Ventilation, and Repair	56	228	5	289
Drainage.....	108	172	9	= 289
			Institutions	102
				391

Seventeen notices were issued.

TABLE X. (DEATHS).

Table showing number of persons in, and number of rooms occupied by Patient's Family.

Rooms per Family. \ Persons in Family.	1	2	3	4	5	6	7	8	9	10	11	12	
1	27	5	1	.	.	.	.	.	.	.	.	.	33
2	.	14	4	.	1	.	.	1	.	.	.	.	20
3	.	5	16	6	3	1	1	.	.	.	.	.	32
4	.	2	6	7	6	1	1	1	1	.	.	.	25
5	.	2	3	13	5	5	2	1	.	1	.	.	32
6	.	11	14	32	25	13	9	5	6	2	1	.	118
7	.	.	3	2	2	.	3	1	.	.	.	.	11
8	.	.	2	4	3	4	1	2	1	1	.	.	18

= 289

Institutions 102

Deaths during year 1909 ... 391

TABLE XI. (DEATHS).

Milk.

242 Cases—Name of milkman reported.
42 ,, Obtained from casual sellers.
6 ,, Used condensed milk.
109 ,, Milk was boiled before use.

Animals Kept.

15 Cases—Kept Animals or Domestic Pets.

Disinfection, etc.

56 Cases—Clothing was Disinfected.
148 ,, Bedding was Disinfected.
228 ,, Rooms were Sprayed.
143 ,. Laundry, Washing, etc., was done at home.

Onset of Fatal Cases.

Period of time from date of "onset" to death.

	Years.											
Period	Under 6 mths	1	2	3	4	5	6	7	8	9	10 & over	?
Cases	70	62	35	23	10	14	1	2	1	0	11	60 = 289

Institutions..... 102

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WINSLEY SANATORIUM.

City Maintained Beds, 1909.

During the year 75 Males and 74 Females made application.

The ages of these 149 applicants were 10 under 15; 55 at ages 15 to 25; 84 at ages 25 to 65.

Admitted to the Sanatorium 43 Males, 32 Females. Total 75.

Period of time (in weeks) from date of receipt of application to date of admission.

1	Case	waited	2	weeks.	
1	,,	,,	3	,,	
4	,,	,,	4	,,	
2	,,	,,	5	,,	
3	,,	,,	6	,,	
3	,,	,,	7	,,	
3	,,	,,	8	,,	
7	,,	,,	9	,,	
4	,,	,,	10	,,	
5	,,	,,	11	,,	
11	,,	,,	12	,,	
6	,,	,,	13	,,	
3	,,	,,	14	,,	
4	,,	,,	15	,,	
5	,,	,,	16	,,	
2	,,	,,	17	,,	
3	,,	,,	18	,,	
2	,,	,,	19	,,	
1	,,	,,	20	,,	
1	,,	,,	21	,,	
2	,,	,,	22	,,	
1	,,	,,	24	,,	
1	,,	,,	30	,,	
75	average—		12	weeks.	

Discharged from Sanatorium 46 Males, 29 Females. Total 75.

The "Class" in which the 76 Discharged cases were placed on admission to the Institution. (Winsley Resident Medical Officer's selection).

Class I.	Cases	19
,, II.	,,	21
,, III.	,,	29
,, IV.	,,	3
Unclassified		3
		75

After History.

After History of Patients treated in the Bristol Maintained Beds at Winsley Sanatorium.

Year of Discharge.	Total No. Discharged.	Alive on 31st December, 1909.	Well and working capacity maintained.	Whereabouts unknown.	Dead.
1905	45	16	12	6	23
1906	67	21	19	10	36
1907	68	37	33	15	16
1908	78	46	43	9	23

The following Table shows how the 149 applications were dealt with :—

60	.. "Selected" and "Admitted."
41	.. Not accepted by Committee.
7	.. Rejected by Medical Consultative Board as "not suitable."
16	.. Withdrawn.
11	.. Waiting admission on 31st December, 1909.
5	.. Died since receipt of application.
9	.. A fresh medical certificate to be sent in.
149	Total.

Condition stated upon Discharge.

67	.. Discharged improved.
2	.. Discharged little improved.
6	.. Discharged not improved.
75	Total.

I am, my Lord Mayor and Gentlemen,

Your obedient Servant,

D. S. DAVIES, M.D., D.P.H.

Medical Officer of Health for the City and County of Bristol, and for the Port of Bristol; General Medical Superintendent City Hospitals; Lecturer on the Principles and Practice of Public Health, University of Bristol (Medical School), and Member of Board of Examiners of the University; Past-President of the Incorporated Society of Medical Officers of Health; of the Bath and Bristol Branch of the British Medical Association; and of the Bristol Medico-Chirurgical Society; Examiner in State Medicine (M.D. Examination), University of London; Member of Board of Examiners of the Royal Sanitary Institute; Late Medical Inspector (on Cholera Survey and General Sanitary Survey of England) to H.M. Local Government Board; Surg. Col. (retd.), V.D. 1st Glos. R.G.A. (T.); Lt. Col. R.A.M.C. Sanitary Service Territorial Force; etc.

June, 1910.

TABLE B. Showing Population, Births, Marriages, and Deaths, and Birth and Death Rates in Bristol, for the 25 Years, 1885–1909. (All figures revised on 1891 Census).

	Estimated Population.	Registered Births.	*Marriages in the District of the Bristol Union.	Deaths.					Annual Rates.			
				Total Deaths at all Ages.	Under 1 Year.	Over 1 and under 5.	Over 60.	In Public Institutions	Birth Rate per 1000.	Death Rate per 1000.	Infantile Mortality to 1000 Births.	Zymotic Rate.
1885	212,586	6,786	974	4,281	1,052	639	1,134	629	31·9	20·1	155·0	2·2
1886	214,134	6,724	949	4,253	1,002	619	1,132	694	31·4	19·8	149·1	2·2
1887	215,694	6,619	956	4,542	996	796	1,244	680	30·6	21·0	150·4	3·0
1888	217,266	6,608	981	3,816	824	432	1,138	710	30·4	17·5	124·6	1·3
1889	218,848	6,694	932	4,021	976	595	1,062	660	30·5	18·3	145·8	2·2
1890	220,442	6,634	1,033	4,532	991	597	1,265	730	30·0	20·5	149·4	2·1
1891	222,049	6,725	937	4,631	972	603	1,371	815	30·3	20·8	144·5	1·7
1892	223,592	6,563	973	4,331	953	634	1,197	776	29·3	19·3	145·2	2·0
1893	225,028	6,788	955	4,241	959	411	1,283	851	30·1	18·8	141·2	1·6
1894	226,578	6,393	920	3,888	848	524	1,077	769	28·8	17·1	148·3	2·0
1895	228,139	6,622	846	4,108	935	414	1,321	837	29·0	18·0	141·1	1·1
1896	230,626	6,537	863	3,960	908	476	1,130	793	27·8	16·8	138·9	1·8
1897	232,242	6,514	884	3,988	949	434	1,195	821	28·0	17·1	145·6	1·8
1898	316,900	9,061	837	5,441	1,491	795	1,455	881	28·5	17·1	164·5	2·6
1899	320,911	9,336	2,714	5,844	1,467	567	1,781	1,049	29·0	18·2	157·1	1·8
1900	324,973	8,972	2,839	5,397	1,185	673	1,561	968	27·6	16·6	131·9	1·8
1901	329,086	8,889	2,786	5,249	1,159	558	1,379§	1,039	27·0	15·9	130·4	1·6
1902	334,632	9,368	2,827	5,905	1,225	965	1,351	1,173	27·4	17·3	130·7	2·7
1903	338,895	9,239	2,738	4,822	1,075	467	1,189	1,094	27·2	14·2	116·3	1·1
1904	343,204	9,145	2,894	5,347	1,222	545	1,386	1,162	26·6	15·5	133·7	1·6
1905	358,515	9,649	2,870	5,286	1,182	623	1,336	1,197	26·9	14·7	122·4	1·6
1906	363,223	9,372	2,793	5,299	1,196	495	1,414	1,188	25·8	14·5	127·6	1·6
1907	367,979	8,915	2,793	4,897	900	327	1,500	1,211	24·2	13·3	100·9	0·8
1908	372,785	8,752	2,806	5,230	1,102	509	1,522	1,247	23·0	13·7	125·8	1·2
1909	**377,642**	**8,507**	**2,670**	**4,869**	**860**	**375**	**1,518**	**1,288**	**22·5**	**12·8**	**101·0**	**0·9**

* Previous to 1899 this includes the Registration Sub-Districts of St. Mary Redcliff, Castle Precincts, St. Paul, St. James, and St. Augustine only.

† The Marriages for 1899 were for the first time given for an area co-extensive with the whole enlarged City.

§ Over 65, according to the new age grouping in the L.G.B Tables.

TABLE C. Showing Number of Deaths from Zymotic Diseases in Bristol, during the 25 years, 1884-1908.

	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	Enlarged City. 1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909
Small Pox ...	10	8	13	26	...	...	1†	...	2‡	16§	...	5	1	...	..	...	...	1	3	1‖	...	..	1	...	9¶
Diphtheria (including M. Croup)	25	28	23	26	15	16	16	38	53	50	34	38	36	44	33	103	124	189	119	105	59	82	65	69	55
Erysipelas ...	10	11	10	21	16	9	12	21	11	8	16	10	5	6	13	12	21	12	8	9	8	7	3	6	3
Scarlet F. ...	21	89	217	45	26	40	37	47	35	16	16	59	18	14	13	39	36	66	49	36	39	27	26	10	12
Typhus ...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...
Enteric F. ...	16	29	23	28	38	33	23	18	26	21	22	20	47	26	35	44	40	59	21	26	13	21	15	10	12
Puerperal F.*	12	8	9	17	11	12	7	25	16	11	8	8	6	11	22	20	17	17	14	16	6	14	11	7	17
Measles ...	159	101	147	61	185	92	239	105	25	116	8	143	57	309	38	200	7	411	11	94	180	140	36	96	90
Wh. Cough...	149	101	124	38	105	201	53	154	80	177	45	64	118	110	118	54	189	105	65	110	123	102	26	128	56
Diarrhœa ...	89	119	117	68	131	96	58	99	125	65	143	106	153	348	345	165	134	110	107	206	169	213	133	154	116

* Previous to 1884, Puerperal Fever was not separated in the Local returns from Puerperal Diseases generally.
† This death occurred in the Novers Hill Hospital outside the City, and so did not appear in the General Returns.
‡ Of these deaths one occurred in the Novers Hill Hospital, outside the City, and so did not appear in the General Returns.
§ Of these deaths five occurred in the Novers Hill Hospital, outside the City, and so did not appear in the General Returns.
‖ This death occurred on the Hospital Ship, Avonmouth. Patient was admitted from Keynsham Workhouse, outside the City.
¶ Including one death which occurred at Cossham Hospital, admitted from Chipping Sodbury Rural District.

CITY OF BRISTOL.

Infectious Disease (Notification Act), 1889.

Notifications received during each Quarter of 1909.

1909.—Table *a*.

NOTIFIABLE DISEASE	First Quarter.	Second Quarter.	Third Quarter.	Fourth Quarter.	Total of each diseases.
Small Pox	31*	7	...	...	**38***
Cholera Choleraic Diarrhœa ...	...	...	...	...	...
Diphtheria (including Membranous Croup)	177	164	159	212	**712**
Erysipelas	72	39	41	47	**199**
Scarlet Fever or Scarlatina	195	200	151	146	**692**
Typhus Fever ...	...	...	...	...	...
Enteric or Typhoid Fever	13	11	21	21	**66**
Relapsing Fever ...	...	...	...	...	...
Continued Fever ...	...	...	...	...	...
Puerperal Fever ...	15	9	8	4	**36**
Totals in each Quarter	**503**	**430**	**380**	**430**	**1,743**

* Including two patients admitted to Novers Hill from Warmley Rural District, and one patient admitted to Cossham Hospital from Chipping Sodbury Rural District.

CITY OF BRISTOL.

TABLE *b*. **Notification and Deaths registered by Sub-Districts during the year 1909.**

	Small Pox.		Choleraic Diarrhœa.		Diphtheria (including Membranous Croup).		Erysipelas.		Scarlet Fever		TYPHUS.		ENTERIC TYPHOID		Relapsing.	Continued		PUERPERAL.		Total cases in each Sub-District.
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths		Cases	Deaths	Cases	Deaths	
Ashley					79	6	15	1	65				4					2	1	165
Bedminster	19	4			139	9	32		136				7	1				5	4	338
Bristol Central	3				71	5	27		62	1			10	4				2		175
Clifton					82	7	14		124	3			1	1				2	2	223
Knowle					24	1	11		24	2			13	2				3	1	75
St. George	2				127	12	32	1	102	4			4	2				7	3	274
St. Philip	7	3			61	8	45	1	78				8					6	1	205
Stapleton	1				61	5	13		66	2			2	2				2		145
Westbury-on-Trym ..					22	1	3		21				3							49
Public Insts.	3				39		7		11				3					4	4	67
Admitted to Public Insts from outside of Borough	3	2			7	1			3				11					3	1	27
Total cases of each disease	38				712		199		692				66					36		1,743
Total deaths from each disease		9				55		3		12				12					17	108
Percentage of deaths to known cases	23·6				7·7		1·5		1·7				18·1					47·2		6·1

CITY OF BRISTOL.

NOTIFICATION—1909.

TABLE *c.* **Showing the number of cases of Infectious Disease notified under the Infectious Disease Notification Act, 1889, since its adoption in 1890.**

	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909
										Enlarged City.										
Small Pox	0	16	0	165	201	4	42	10	2	0	0	1	6	46	34	13	32	6	1	38
Diphtheria (including Membranous Croup)	56	70	106	141	128	165	258	205	217	215	506	908	1,109	1,134	1,051	1,021	839	926	924	712
Erysipelas	105	135	196	230	154	195	246	203	263	337	342	392	376	244	256	303	239	244	223	199
Scarlet Fever ...	559	888	1,442	1,245	485	562	1,352	511	382	697	1,957	2,206	2,724	2,168	1,258	1,085	1,019	886	486	692
Typhus	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Enteric Fever ...	122	117	135	122	90	89	110	350	113	219	285	281	319	134	172	76	120	74	103	66
Continued or Doubtful Fever ...	6	8	3	6	1	1	2	0	0	2	2	2	1	0	0	0	0	0	0	0
Puerperal Fever ...	11	11	34	30	18	16	21	10	18	36	46	43	39	31	27	30	37	36	22	36

COMPARATIVE TABLE—Showing the Estimated Population, Birth-rate, Death-rate, Zymotic-rate, Fever Death Rate, Diarrhœa Death Rate, and Infantile Death Rate of the 15 LARGEST TOWNS OF ENGLAND (those having a population of over 200,000); also of EDINBURGH, GLASGOW, DUBLIN, BELFAST and CARDIFF, for the Year 1909, compared with the same particulars and rates for the group of 76 large towns. *From the Registrar General's Return.*

	Estimated Population, middle of 1909.*	Birth-rate.	Death-rate.	Zymotic rate.	Fever Death-rate.	Diarrhœa Death-rate.	Deaths under 1 year to 1000 Births.
76 Large Towns ...	16,445,281	25·7	14·7	1·42	0·06	0·38	118
London	4,833,938	24·2	14·0	1·31	0·03	0·33	108
Liverpool	760,357	31·1	19·0	2·11	0·07	0·70	144
Manchester	655,435	27·8	17·9	1·81	0·14	0·43	134
Birmingham	563,629	26·6	15·4	2·03	0·04	0·45	134
Leeds	484,012	22·8	14·1	0·80	0·09	0·23	122
Sheffield	470,958	28·2	15·1	1·78	0·07	0·55	118
Bristol	**377,642**	**22·6**	**12·7**	**0·87**	**0·03**	**0·27**	**100**
West Ham	321,767	27·2	14·0	2·24	0·02	0·65	124
Bradford	293,983	18·8	14·5	0·68	0·05	0·16	116
Newcastle-on-Tyne	281,584	27·3	14·8	1·22	0·06	0·20	119
Hull	275,552	29·4	14·9	1·38	0·04	0·57	114
Nottingham	263,443	25·7	16·3	1·67	0·08	0·69	150
Leicester	244,255	21·9	12·9	1·22	0·02	0·43	127
Salford	241,950	27·9	18·0	2·45	0·18	0·50	141
Portsmouth	214,726	27·2	14·2	1·42	0·15	0·25	96
Edinburgh	†355,366	20·9	15·3	1·24	0·01	0·31	119
Glasgow	†872,021	26·5	17·5	2·41	0·12	0·49	133
Dublin	§398,356	28·7	20·9	1·58	0·17	0·53	141
Belfast	§386,576	28·3	18·2	1·33	0·06	0·63	139
Cardiff	195,303	25·8	13·1	0·85	0·04	0·32	103

* These Populations are based on the 1901 Census returns. † The Figures for Edinburgh and Glasgow are for the calendar year.
§ Excluding Deaths of Persons admitted to Public Institutions from without the boundary.

TABLE I. **Vital Statistics of Whole District during 1909 and Previous Years.**

CITY OF BRISTOL.

YEAR.	Population estimated to Middle of each Year.	BIRTHS.		TOTAL DEATHS REGISTERED IN THE DISTRICT.				TOTAL DEATHS IN PUBLIC INSTITUTIONS IN THE DISTRICT.	Deaths of Non-residents registered in Public Institutions in the District.	Deaths of Residents registered in Public Institutions beyond the District.	NETT DEATHS AT ALL AGES BELONGING TO THE DISTRICT.	
				Under 1 Year of Age.		At all Ages.						
		Number.	Rate per 1000 population.	Number.	Rate per 1000 Births registered.	Number	Rate per 1000 population.				Number.	Rate per 1000 population.
1	2	3	4	5	6	7	8	9	10	11	12	13
1899	320,911	9,336	29·0	1,467	157·1	5,844	18·2	1,048	89		5,755	17·9
1900	324,973	8,972	27·6	1,185	131·9	5,397	16·6	971	79		5,318	16·3
1901	329,086	8,889	27·0	1,159	130·4	5,249	15·9	1,039	79		5,170	15·7
1902	334,632	9,368	27·4	1,225	130·7	5,905	17·3	1,173	115		5,790	16·9
1903	338,895	9,239	27·2	1,075	116·3	4,822	14·2	1,094	118		4,704	13·8
1904	343,204	9,135	26·6	1,222	133·7	5,347	15·5	1,162	109		5,238	15·2
1905	358,515	9,649	26·9	1,182	122·4	5.286	14·7	1,197	97	4	5,193	14·4
1906	363.223	9,372	25·8	1,196	127·6	5,299	14·5	1,188	101	2	5,200	14·3
1907	367,979	8,915	24·2	900	100·9	4,897	13·3	1,211	113	1	4,785	13·0
1908	372,785	8,753	23·0	1,102	125·8	5,230	13·7	1,247	131	10	5,109	13·4
Averages for years 1899-1908 ...	345,420	9,162	26·5	1,171	127·7	5,327	15·4	1,133	103	*	5,226	15·1
1909	377,642	8,507	22·5	860	101·0	4,869	12·8	1,288	130	6	4,745	12·5

*The information required is not available.

NOTE.—The deaths to be included in Column 7 of this table are the whole of those registered during the year as having actually occurred within the district or division. The deaths to be included in Column 12 are the number in Column 7, corrected by the subtraction of the number in Column 10 and the addition of the number in Column 11.

By the term "Non-residents" is meant persons brought into the district on account of sickness or infirmity, and dying in public institutions there: and by the term "Residents" is meant persons who have been taken out of the district on account of sickness or infirmity, and have died in public institutions elsewhere.

The "Public Institutions" to be taken into account for the purposes of these Tables are those into which persons are habitually received on account of sickness or infirmity, such as hospitals, workhouses and lunatic asylums. A list of the Institutions in respect of the deaths in which corrections have been made should be given on the back of this Table.

Area of District in acres (exclusive of area covered by water) 11,705

Total population at all ages 328,945
Number of inhabited houses 58,235
Average number of persons per house .. 5·6
(At Census of 1901.)

I. Institutions within the District receiving sick and infirm persons from outside the District.	II. Institutions within the District receiving sick and infirm persons from the District.	III. Other Institutions, the deaths in which have been distributed among the several localities in the District.
Royal Infirmary.	Royal Infirmary.	City Hospitals:—
General Hospital.	General Hospital.	Novers Hill,
Children's Hospital.	Children's Hospital.	Ham Green,
		Clift House (closed July, 1906).
Cossham Hospital.	Cossham Hospital.	
Convalescent Home.	Convalescent Home.	
Orthopædic Hospital.	Orthopædic Hospital.	

Municipal Institutions (within the City)—

Eastville Workhouse.

Southmead Workhouse.

Stapleton Workhouse.

Lunatic Asylum.

CITY OF BRISTOL.

Table II

Vital Statistics of Separate Localities (Registration Sub-Districts) in 1909 and previous years.

Names of Localities.	1.—Ashley.				2.—Bedminster.				3.—Bristol Central.			
Year.	Population estimated to middle of each Year. a.	Births registered. b.	Deaths at all Ages. c.	Deaths under 1 year. d.	Population estimated to middle of each Year. a.	Births registered. b.	Deaths at all Ages. c.	Deaths under 1 year. d.	Population estimated to middle of each Year. a.	Births registered. b.	Deaths at all Ages. c.	Deaths under 1 year. d.
*1899 ...	38,921	880	496	108	53,814	2,010	1,014	344	54,247	1,282	993	227
1900 ...	40,107	843	510	109	54,828	1,938	909	236	54,108	1,158	826	150
1901 ...	42,548	877	472	73	55,838	1,984	894	248	53,001	1,082	795	194
1902 ...	40,881	875	502	100	61,672	2,087	968	237	44,744	1,131	829	176
1903 ...	42,039	943	462	92	63,142	2,041	797	229	43,726	1,065	618	139
1904 ...	42,842	894	411	75	64,505	2,003	850	243	42,793	1,027	706	157
1905 ...	44,144	921	445	86	65,877	2,072	826	234	41,864	1,042	771	162
1906 ...	45,023	906	468	72	67,261	1,981	865	256	40,936	1,024	665	178
1907 ...	45,909	908	469	68	68,652	1,937	775	195	40,011	920	621	109
1908 ...	46,802	837	501	81	70,055	1,765	787	217	39,087	957	628	156
Averages of Years 1899 to 1908.	42,921	888	473	86	62,564	1,981	868	243	45,451	1,068	745	164
1909 ...	47,702	803	485	59	71,469	1,736	709	175	38,165	915	621	129

Names of Localities.	4.—Clifton.				5.—Knowle.				6.—St. George.			
Year.	Population estimated to middle of each Year. a.	Births registered. b.	Deaths at all Ages. c.	Deaths under 1 year. d.	Population estimated to middle of each Year. a.	Births registered. b.	Deaths at all Ages. c.	Deaths under 1 year. d.	Population estimated to middle of each Year. a.	Births registered. b.	Deaths at all Ages. c.	Deaths under 1 year. d.
*1899 ...	46,869	770	658	97	8,346	339	141	42	48,155	1,783	819	278
1900 ...	47,301	660	577	74	8,585	352	171	45	48,763	1,764	725	242
1901 ...	46,820	701	552	71	8,671	401	146	37	50,501	1,798	755	248
1902 ...	44,260	665	591	77	13,709	452	199	56	58,194	1,842	884	253
1903 ...	44,435	660	494	56	14,058	451	153	39	59,738	1,822	747	214
1904 ...	44,446	688	556	68	14,679	522	200	65	61,670	1,779	853	273
1905 ...	41,462	702	558	69	15,302	548	199	50	63,612	1,792	759	216
1906 ...	44,483	696	541	75	15,928	530	210	57	65,567	1,703	706	196
1907 ...	44,504	620	507	67	16,558	512	214	44	67,533	1,551	623	144
1908 ...	44,539	634	530	58	17,191	504	197	49	69,511	1,635	720	198
Averages of Years 1899 to 1908.	44,911	679	556	71	13,302	461	183	48	59,324	1,746	759	226
1909 ...	44,573	670	542	65	17,828	487	172	26	71,501	1,541	635	154

Names of Localities.	7.—St. Philip.				8.—Stapleton.				9.—Westbury-on-Trym.			
Year.	Population estimated to middle of each Year. a.	Births registered. b.	Deaths at all Ages. c.	Deaths under 1 year. d.	Population estimated to middle of each Year. a.	Births registered. b.	Deaths at all Ages. c.	Deaths under 1 year. d.	Population estimated to middle of each Year. a.	Births registered. b.	Deaths at all Ages. c.	Deaths under 1 year. d.
*1899 ...	52,909	1,656	841	271	17,650	530	251	63				
1900 ...	53,067	1,603	907	249	18,214	491	238	53				
1901 ...	52,269	1,477	794	208	19,438	569	221	80				
1902 ...	48,891	1,665	997	258	22,191	607	257	60				
1903 ...	48,986	1,614	711	203	22,771	553	214	64				
1904 ...	48,810	1,545	814	238	23,459	575	260	62				
1905 ...	48,639	1,586	735	226	24,151	556	241	68	10,464	347	135	41
1906 ...	48,472	1,551	803	238	24,847	555	222	57	10,706	334	141	34
1907 ...	48,310	1,494	648	156	25,547	569	251	56	10,950	300	99	22
1908 ...	48,152	1,413	757	229	26,252	589	275	57	11,196	324	107	28
Averages of Years 1899 to 1908.	49,850	1,560	800	227	22,452	559	243	62				
1909 ...	47,999	1,448	621	153	26,961	524	216	47	11,444	272	118	24

* The Registration Sub-districts were so interchanged at the extension of the City in 1897, by the consequent re-arrangement of boundaries in 1898, that this Table cannot be given for previous years.

CITY OF BRISTOL.

Cases of Infectious Disease notified during the Year ending 1st January, 1910

Notifiable Diseases.	Cases notified in Whole District.							Total Cases notified in each Locality.										Nos. of Cases removed to Hospital from each Locality.										
	At all Ages.	At Ages—Years.						Ashley	Bedminster	Bristol Central	Clifton	Knowle	S. George	S. Philip	Stapleton	Westbury-on-Trym	Public Institutions	Not belonging to Borough	Ashley	Bedminster	Bristol Central	Clifton	Knowle	S. George	S. Philip	Stapleton	Westbury-on-Trym	Public Institutions	Not belonging to Borough
		Under 1.	1 to 5.	5 to 15.	15 to 25.	25 to 65.	65 and upwards.																						
Small-pox	41	1	1	10	8	21	...	1	19	3	...	...	2	7	1	...	6	2	1	15	3	...	...	2	7	1	...	4	2
Cholera	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Diphtheria including Membranous Croup	712	13	191	406	61	40	1	79	139	71	82	24	127	61	61	22	39	7	49	100	35	49	19	66	35	36	11	20	6
Erysipelas	199	4	7	18	25	119	26	15	32	27	14	11	32	45	13	3	7	..	...	7	...	...	...	1	5	...	...	3	...
Scarlet fever	692	8	178	438	52	16	...	65	136	62	124	24	102	78	66	21	11	3	42	85	49	84	15	63	71	47	14	10	4
Typhus fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...
Enteric fever	66	...	3	20	21	22	...	4	7	10	1	13	4	8	2	3	3	11	2	7	9	3	11	2	8	1	1	2	10
Relapsing fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Continued fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Puerperal fever	36	...	...	...	12	24	...	2	5	2	2	3	7	6	2	..	4	3	1	1	2	2	...	2	3	1	...	1	3
Plague	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...
Totals	1746	26	380	892	179	242	27	166	338	175	223	75	274	205	145	49	70	26	95	215	98	138	45	136	129	86	26	40	25
Phthisis — Voluntary	395	...	3	17	110	255	10	37	98	57	34	26	51	69	17	3	4	...											
Phthisis — Poor Law	173	...	...	6	24	140	3	7	21	35	4	7	15	41	7	5	25	6											

Table IV

CITY OF BRISTOL

Causes of, and Ages at, Death during the Year ending January 1st, 1910.

Cause of Death.	Deaths in whole District at subjoined Ages.							Deaths in Localities at all Ages).											Deaths in Public Institutions.
	All ages.	Under 1.	1 and under 5.	5 and under 15.	15 and under 25	25 and under 65	65 and upwards	Ashley	Bedminster	Bristol Central	Clifton	Knowle	S. George	S. Philip	Stapleton	Westbury-on-Tryn	Municipal Institutions	Not belonging to Borough	
SMALL-POX	9	1	...	3	...	5	...	...	4	...	...	...	...	3	...	...	...	2	7
Chicken Pox	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
MEASLES	90	27	58	5	...	...	...	10	27	16	6	2	8	14	2	5	...	..	3
SCARLET FEVER	12	...	7	4	1	...	...	...	...	1	3	2	4	..	2	...	...	...	9
WHOOPING-COUGH ...	56	30	23	3	...	...	...	6	17	12	4	2	7	4	1	1	2	...	4
DIPHTHERIA (including Membraneous Croup ...	55	2	34	17	1	...	1	6	9	5	7	1	12	8	5	1	...	1	29
Croup	3	1	2	...	...	...	...	1	2	...	...	...	...	...	...	...	...	...	...
FEVER — Typhus	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
FEVER — Enteric	12	...	...	1	5	6	...	...	1	4	1	2	2	...	2	...	...	...	9
FEVER — Other continued ...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...
Cerebro Spinal Meningitis ...	4	1	...	1	1	1	...	...	...	1	1	..	...	1	...	...	..	1	3
Influenza	27	...	1	...	1	11	14	4	1	6	2	1	1	2	...	3	7	...	7
Cholera	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Plague	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
DIARRHŒA	116	101	11	...	...	1	3	6	23	20	4	1	22	35	3	2	...	...	22
Enteritis	25	19	2	...	...	1	3	3	7	2	3	1	1	5	...	3	...	...	6
Puerperal fever	17	...	...	...	3	14	...	1	4	...	2	1	3	1	...	...	4	1	11
Erysipelas	3	1	...	...	...	1	1	1	...	...	...	...	1	1	...	...	...	...	...
Other septic diseases	11	3	...	2	1	4	1	2	...	1	2	1	2	...	...	...	...	3	7
Phthisis	391	1	6	12	80	282	10	31	55	43	28	19	42	53	24	10	83	3	101
Other Tubercular diseases ...	133	26	42	23	18	19	5	11	27	22	9	7	16	20	6	2	8	5	55
Anthrax	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cancer, malignant disease ...	357	...	2	1	5	210	139	44	46	47	50	14	44	29	6	5	50	22	113
Bronchitis	425	45	24	2	2	139	213	37	60	56	41	11	53	90	14	11	50	2	54
Pneumonia	312	69	66	12	13	106	46	24	46	45	27	10	51	46	13	9	38	3	78
Pleurisy	12	...	1	...	1	8	2	3	2	1	3	2	1	...	...	...	...	...	...
Other diseases of Respiratory Organs	82	5	10	1	1	40	25	5	9	7	12	5	8	8	2	3	21	2	28
Alcoholism / Cirrhosis of liver	50	1	...	...	1	36	12	7	7	10	7	1	6	4	3	3	1	1	13
Venereal diseases	15	12	...	...	1	1	1	1	2	2	1	...	2	2	...	...	5	...	7
Premature birth	165	165	...	...	...	...	...	16	37	19	13	6	33	16	18	3	3	1	13
Diseases and accidents of parturition	14	1	...	1	1	11	...	2	4	1	1	...	3	1	2	...	...	...	3
Ac. Rheumatism, Rh. Fever ...	20	...	...	2	2	9	7	2	...	3	3	1	5	3	2	...	1	...	3
Heart diseases	449	8	5	14	17	208	197	64	70	47	60	18	76	44	24	6	38	2	69
Diseases of Blood Vessels ...	292	1	...	1	3	116	171	38	41	37	30	15	31	40	14	7	34	5	58
Diseases of Nervous System ...	352	104	28	20	16	103	81	29	54	36	44	9	41	39	8	9	77	6	98
Diseases of Urinary System ...	207	3	3	7	7	100	87	15	15	15	24	9	24	23	12	6	56	8	97
Other Diseases of the Digestive System..	167	25	10	7	16	71	38	19	18	25	16	9	17	21	12	6	5	19	79
Accidents—Negligence	136	5	20	13	12	54	32	10	12	23	21	5	16	18	7	...	12	12	68
Suffocation—Overlying	18	17	...	...	...	1	...	...	5	3	2	1	2	3	...	...	2	...	2
Homicide	1	...	...	..	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...
Suicide	40	...	...	1	1	33	5	3	1	8	5	1	9	5	2	1	1	4	8
All other causes	790	186	19	15	17	129	424	83	103	103	110	15	91	82	32	22	122	27	224
All causes	4869	860	375	168	227	1721	1518	485	709	621	542	172	635	621	216	118	620	130	1288

CITY RATES.

No. of Births.	Birth Rate.	Death Rate. This Year.	Death Rate. Last Year.	Death Rate. 10 Years' Average	Principal Epidemic Diseases (Zymotic) Rate.	Infantile Rate.
Males. Females. 1275 1232 8507	22·52	12·89	13·76	15·42	0·92	101·09

District Death Rates	10·16	9·91	16·80	11·91	9·64	8·86	12·90	8·01	10·30		...
District Birth Rates	16·83	24·28	24·76	14·72	27·31	21·50	30·07	19·43	23·76	...	...
Deaths of Infants under 1	59	175	129	65	26	154	153	47	24		...
Number of Births M	362	894	447	357	257	788	720	249	142	...	...
Number of Births F	441	842	468	313	230	753	728	275	130	...	...
	803	1736	915	670	487	1541	1448	524	272	....	
Infantile Rate .	73·4	100·8	140·9	97·0	53·3	99·9	105·6	89·6	88·2	...	...

Average age at Death of persons aged 65 and upwards, 75 years and 2 months

Births of Illegitimate Children (Males 159, *Females* 137)—296

Deaths „ „ 69

Inquests 420

Uncertified Deaths 6

TABLE V. **INFANTILE MORTALITY during the Year ending 1st January, 1910.**

Deaths from Stated Causes in Weeks and Months under One Year of Age.

CAUSE OF DEATH.	Under 1 Week.	1-2 Weeks.	2-3 Weeks.	3-4 Weeks.	Total under 1 Month.	1-2 Months.	2-3 Months.	3-4 Months.	4-5 Months.	5-6 Months.	6-7 Months.	7-8 Months.	8-9 Months.	9-10 Months.	10-11 Months.	11-12 Months.	Total Deaths under 1 Year.
All Causes :—																	
Certified	192	51	42	37	322	81	64	59	52	44	49	40	36	43	38	26	854
Uncertified	4	..	..	..	4	..	..	1	1	..	..	..	..	..	..	..	6
Common Infectious Diseases :—																	
Small-pox	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1
Chicken-pox	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Measles	..	..	..	..	..	..	..	3	1	1	1	3	1	7	7	3	27
Scarlet Fever	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diphtheria: Memb. Croup	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	2
Whooping Cough	..	..	..	..	..	4	1	3	3	2	3	3	2	3	..	4	28
Diarrhœal Diseases :—																	
Diarrhœa, all forms	..	1	3	4	8	9	11	12	13	6	14	5	7	6	9	3	103
Enteritis (not Tuberculous)	..	..	1	1	2	2	3	4	2	2	2	..	..	1	1	..	19
Gastritis, Gastro-intestinal Catarrh	1	1	..	..	2	1	..	..	..	2	..	..	..	..	..	..	5
Wasting Diseases :—																	
Premature Birth	111	21	12	5	149	8	3	1	1	2	..	..	..	..	..	..	164
Congenital Defects	1	1	..	..	2	1	..	..	..	..	..	..	..	..	..	..	3
Injury at Birth	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1
Want of Breast-milk	..	1	..	..	1	..	1	..	1	..	..	..	..	..	..	..	3
Atrophy, Debility, Marasmus	6	6	11	10	33	13	11	16	7	4	6	..	2	1	..	2	95
Tuberculous Diseases :—																	
Tuberculous Meningitis	..	..	..	..	..	2	1	..	..	1	1	2	2	5	1	..	15
Tuberculous Peritonitis: Tabes Mesenterica	..	..	..	..	..	1	1	2	..	1	..	..	1	..	..	..	6
Other Tuberculous Diseases	..	..	..	..	..	..	..	..	..	..	..	1	2	..	1	2	6
Erysipelas	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1
Syphilis	..	..	1	1	2	2	2	3	2	..	..	1	..	..	..	..	12
Rickets	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1
Meningitis (not Tuberculous)	..	..	..	..	..	1	1	..	1	2	1	..	1	2	1	1	11
Convulsions	22	9	6	6	43	11	8	3	..	3	4	6	1	2	6	2	89
Bronchitis	..	1	..	3	4	2	8	2	6	3	2	4	5	7	1	..	44
Laryngitis	..	..	..	..	..	1	..	..	..	..	1	..	1	..	..	..	3
Pneumonia	..	1	2	1	4	5	4	..	3	4	9	8	8	7	7	8	67
Croup—Spasmodic	..	..	..	..	..	..	1	1	..	..	..	1	..	..	..	..	3
Suffocation, overlying	5	1	..	1	7	3	1	..	3	2	..	1	..	..	..	..	17
Other Causes	49	8	6	5	68	15	6	10	8	8	5	4	3	2	4	1	134
	196	51	42	37	326	81	64	60	53	44	49	40	36	43	38	26	860

PART II.

GENERAL.

WATER SUPPLY.

The Bristol Water Works Company.

Sources of Supply.—(1) Springs in the triassic conglomerates and carboniferous limestone of the Mendip Hills, 16 miles from the City. (2) The Yeo Reservoir, and Richford and Langford Springs, 12 miles from City. (3) Deep wells at Chelvey in the New Red Sandstone (triassic).

Store Reservoirs.—At Barrow Gurney, where the water is filtered before delivery.

Water Service.—Constant.

Average Daily Consumption.—23 Gallons per head.

The City Analyst furnishes the following Report.

Analysis of Water.

Nineteen samples were examined—seven samples representing the City water supply were reported upon, and this report appears.

Twelve other samples were received—seven from the Medical Offieer of Health, and five from the City Engineer. The following conclusions were found in referenec to those reccived from the Medieal Officer :—

Sewage pollution was evident in two eases, one of whieh also showed surfaee drainage. One sample showed past pollution. One sample showed intermittent pollution, and one sample fell within the limits of sanitary purity.

Analytical Data (Chemical and Bacteriological) of City Water Supply.

Number of sample	1.		2.		4.		7.		9.		16.		19.	
Date of collection	24th February.		17th March.		6th May.		16th July.		26th July.		6th October.		29th November.	
Place of collection	Tap in Laboratory.		Tap in Laboratory.		Tap in Laboratory.		Tap in Laboratory.		Barrow Gurney.		Tap in Laboratory.		Barrow Gurney.	
Physical appearance	Clear, bright, neutral to litmus.		Clear, bright, neutral to litmus.		Clear, bright, neutral to litmus.		Clear, bright, neutral to litmus.		Clear, bright, neutral to litmus.		Clear, bright, neutral to litmus.		Clear, bright, neutral to litmus.	
Remarks on solids	No smell on heating solids.		No smell on heating solids.		No smell on heating solids.		No smell on heating solids.		No smell on heating solids.		No smell on heating solids.		No smell on heating solids.	
	Parts per 100,000.	Grains per gallon.	Parts per 100,000.	Grains per gallon.	Parts per 100,000.	Grains per gallon.	Parts per 100,000.	Grains per gallon.	Parts per 100,000.	Grains per gallon.	Parts per 100,000.	Grains per gallon.	Parts per 100,000.	Grains per gallon.
Free Ammonia	nil.		traces		traces		nil.		nil.		nil.		nil.	
Albuminoid Ammonia ..	·006	·0042	·006	·0042	·005	·0035	·001	·0007	·004	·0028	·0035	·00245	·0015	·00105
Nitrogen in Nitrates ..	·17	·12	·124	·086	·128	·09	·128	·09	·048	·033	·128	·09	·20	·14
Chlorine as Chlorides ..	1·7	1·2	1·7	1·2	1·7	1·2	1·7	1·2	1·64	1·15	1·5	1·05	1·7	1·2
Total Hardness		13·5°		13·5°		13·2°		13·8°		10·8°		12·4°		15°
Permanent Hardness ..		4·4°		4·7°		4·8°		11·2°		4·0°		4·0°		5·6°
Temporary Hardness ..		9·1°		8·8°		8·4°		9·6°		6·8°		8·4°		9·4°
Total Solids	34	23·8	34·8	24·15	32·5	22·75	31·9	22·33	29·25	20·47	32·25	22·57	37·25	26·08
Mineral Matter	22·75	15·93	22·5	15·75	20·0	14·0	19·4	13·58	18·5	12·95	22·0	15·4	24·0	16·8
Loss on ignition ..	11·25	7·87	12·0	8·4	12·5	8·75	12·5	8·75	10·75	7·52	10·25	7·17	13·25	9·28
Oxygen absorbed in two hours at 80° F.	·028	·02	·044	·017	—	—	—	—	—	—	—	—	·024	·0168
Nitrites	nil		nil		nil		nil		nil		nil		nil	
Lead	nil		nil		nil		nil		nil		nil		nil	
Colonies per cc on Gelatine at 22° C. ..	39	..	12		12		14				18		24	
Colonies per cc on Agar at 37° C.	1	..	1		4		11				2		5	
MacConkey's Bile Salt broth (B. coli test) 25cc water used	Gas:—	—		—		—		—		—		—		—
	Acidity:—	slight		slight				+		—		+		+

Sewerage, Drainage, Scavenging, etc.

All these matters are reported upon annually by the City Engineer to the Sanitary Committee, and the Report is published.

Parks and Open Spaces.

The Parks and Open Spaces available for the recreation of the people comprise in all 800 acres, including Clifton and Durdham Downs, which have a combined area of 442 acres.

Of the 800 acres, 358 are laid out as parks, gardens, or playgrounds ; but the public has the right to wander over about 603 acres. Wicket pitches are allowed on Durdham Down and in five of the parks, where also Bowling Greens and Tennis Courts have been laid out. In one park a lake is provided with boats. The net annual cost of the Parks and Open Spaces is about £5,700.

Medical Inspection in Public Elementary Schools.

The number of children attending the Board Schools in September, 1897, before the extension of the City, was 18,077, and attending other schools was 21,868 ; or a total of 39,945. In 1898 the City was enlarged, a further enlargement took place in 1904, and by the 1st January, 1910, the total number of scholars on the registers of the schools controlled by the Education Committee was 59,841.

	No. of Schools.	No. of Children on Registers.
Council Schools	43	38,322
Church of England Schools..	42	18,996
Wesleyan Schools	1	671
Friends' School	1	405
Roman Catholic Schools ..	5	1,447
Totals	92	59,841

I am informed that there were 46 children under three years of age on the registers of the Public Elementary Schools in October, 1909. Since 1905 the Education Committee have excluded children under five years of age from certain schools.

In some of the poorer districts, however, children under five are admitted.

The number of children under eight years of age on the registers of the Public Elementary Schools in October, 1909, was 24,282, and of that number, 4,514 were under five years of age.

Medical inspection of school children, for strictly limited purposes, has been provided by the Education Committee, under the Education (Administrative Provisions) Act, 1907, independently of the Health Committee.

The City has been divided into five districts, to each of which a part-time Medical Officer, in general practice, has been appointed, who devotes three school half-days, of two and a half hours each, per week to the work.

The work was commenced on September 1st, 1908, the first month being utilised in a general survey to discover cases of under-feeding in some of the poorest districts, in view of the scheme for providing meals since adopted by the Committee.

Two whole-time Health Visitors or Nurses have been appointed, each taking one of the two school groups into which the Schools in the City have been divided; these Nurses are chiefly engaged, under medical instructions, in attending to the dirty heads, discharging ears, and general conditions of cleanliness; they also visit the homes and advise the parents.

The School Medical Officers now make a detailed examination of the hygienic condition of the schools.

Co-relation of the School Medical Service with the Public Health Service.

In 1905, as there were then no School Medical Officers, and it was desirable that the Teachers should co-operate with the Health Department in dealing with communicable diseases in schools, the Education Committee adopted certain Regulations under which the Head Teacher has to forward a card to the Medical Officer of Health, giving notice of any case of known or suspected sickness in the school. These regulations were especially designed to secure early information as to Measles, Whooping Cough, Chicken-pox, German Measles, or Mumps, which, as they are not notified by Medical Practitioners, may readily escape notice, though they form a considerable proportion of school illness.

Upon receipt of the cards from the Head Teachers, general enquiries are made at the affected houses by the District Inspectors, and precautionary notices left. The card is returned to the school with the provisional date for return marked upon it.

The Education Committee were advised to adopt these Regulations in 1905, not as a satisfactory solution of the question of dealing with communicable disease in schools, but as a temporary expedient until Medical Officers of schools were appointed, when it was hoped the School Medical Officer would be able to deal with the control of disease among the scholars in school, of which he would be in a position to gain earliest knowledge. This is the plan which has worked satisfactorily in London, where the School Medical Officer is distinct from the Medical Officer of Health, and it would seem to be the only satisfactory plan under such circumstances.

Up to the present, Measles epidemics, which recur periodically, have not been satisfactorily controlled, as it has been found to be impracticable, without being in

daily Medical touch with the schools, to detect the very earliest cases ; and if these are missed subsequent control is impossible. The best of Teachers are generally a few days too late in detecting the early Measles cases, and it is just these few days that matter. In the most recent Education Code, the power of voluntary school closure or exclusion of particular scholars is definitely given to the School Medical Officer, with whose duties in this respect the Medical Officer of Health cannot interfere, except through the Health Committee ; and the control of Measles must be initiated at the schools, and, if it is to be effectual, by the School Medical Officer.

In the case of Diphtheria or Scarlet Fever in schools, as with Measles, the duties of the Medical Officer of Health and of the School Medial Officer meet, but it is not quite clear, as yet, how they blend.

Before the appointment of School Medical Officers, it became necessary, upon the outbreak of Diphtheria in a school, to secure special Medical assistance, in order to make an individual examination of whole classes, or of whole schools ; this assistance was provided by the Health Committee, as there were no School Medical Officers, but the work would seem to be essentially a work of school medical inspection.

At present the School Medical Inspecting Staff is not strong enough to undertake the heavy strain of such epidemic work ; and the Health Department has no means of doing it except by the provision of special medical assistance ; it cannot be effectually done first by one at the inception of an outbreak, and then, upon its wide extension, by the other, for such divided counsels would, perhaps, result in trouble. It would be well to clearly understand what is, in the opinion of the Central Education Authority, the proper adjustment of the duties of the Education and Health Authorities in regard to

epidemic disease amongst scholars in school, and this does not appear to be made much clearer by the Memorandum on Closure of and Exclusion from School, published in 1909.

Meanwhile the Health Committee continue the action taken before the appointment of School Medical Officers.

The following table shows the number of cases of non-notifiable diseases forwarded to the Medical Officer of Health.

1909.

	1st Quarter ending 3rd April.	2nd Quarter ending 3rd July.	3rd Quarter ending 2nd October.	4th Quarter ending 1st Jan., 1910.	Total
Measles	297	159	173	497	1,126
Chicken-pox ..	229	150	50	90	519
Whooping Cough	45	45	27	64	181
Mumps	44	9	12	72	137
Suspicious Throats & Rashes	14	20	20	33	87
	629	383	282	756	2,050

No returns of any of these diseases have been received from the following schools during the year 1909.

Avonmouth (V.),
Cutlers' Hall (V.), Rosemary Street.
Day Industrial, Temple Backs.
Downend Road (C.) (temp.)
Dr. Bell's (V.), Fishponds Road.
Fishponds College Practising School (Girls), Oldbury Court Road.

Holy Cross, R.C. (V.), Victoria Street, Temple.
Hotwells (C.), Hope Chapel Hill.
Orchard Place, Stillhouse Lane.
Park Place, R.C. (V.)
Portland (C.), Henrietta Street, Kingsdown.
Redcross Street (C.)
St. George's (V.), Brandon Hill.
St. George (C.)
St. Mary's, Redcliff, Boys', (V.), Redcliff Parade.
St. Mary's, Redcliff, Girls' and Infants' (V.), Ship Lane.
St. Matthias (V.), Broad Weir.
St. Michael's (V.), Old Park.
St. Nicholas with St. Leonard's (V.), Queen Charlotte Street.
St. Nicholas, R.C. (V.), Pennywell Road.
St. Philip's Church (V.), Tower Hill.
Shirehampton (V.)
Stapleton (V.), Stapleton.
Stoke Bishop (V.)
Sussex Street (C.)
Victoria Road (temp.)

Housing of the Working Classes.

The following Table shows the action taken over a period of 20 years :—

Date.	No. of Houses dealt with.	No. of Houses closed.	No. of Houses made habitable.
1890	35	30	5
1891	72	27	45
1892	26	18	8
1893	2	0	2
1894	34	18	16
1895	31	18	13
1896	28	10	18
1897	4	3	1
1898	9	7	2
1899	33	31	2
1900	21	6	15
1901	6	1	5
1902	64	61	3
1903	67	58	9
1904	34	16	18
1905	28	11	17
1906	9	9	0
1907	18	15	3
1908	30	12	18
1909	17	9	8
Total ..	568	360	208

Municipal Lodging House.

This Lodging House was opened on April 20th, 1905.

The total number of nightly occupations from the 26th March, 1909 to the 25th March, 1910, was 28,008, or an average of 77 lodgers per night during the whole of the period under notice, the total number of beds available being 120. The house was opened on 20th April, 1905, with 60 beds, and continued with this number until the 17th September, 1905, the average number of lodgers per night during that period was 42. On the 17th September, 1905, the number of beds was increased to 120 and the average nightly occupations from that date to 25th March, 1906, was 74.

MORTUARIES.

Quakers' Friars, off Merchant Street, *post-mortem* Examination Room and Coroner's Court adjoining.

In addition to the above, there are Mortuaries for Police purposes at Bedminster and Redland Police Stations.

A new Mortuary has been constructed at Avonmouth.

THE MIDWIVES' ACT, 1902.

The Council of the City of Bristol on 10th November, 1902, deputed the working of this Act to the Watch Committee (Police). I have no information as to the working of the Act.

Thirty-six notifications of Puerperal Fever have been notified during the year, and seventeen deaths have been reported.

Eleven Midwives in attendance on the cases have had disinfecting baths under the superintendence of a Nurse, and in five instances their instruments have been thoroughly cleansed and disinfected, and in one instance destroyed and replaced.

Notification of Births Act, 1907.

This Act, which is adoptive, provides for the notification of every birth, within 36 hours, to the Medical Officer of Health.

As a penalty attaches to default, and Medical practitioners become liable, some opposition has been manifested to the adoption of the Act.

The Local Government Board will not approve of the adoption of the Act unless satisfactory means are provided for giving effect to its intention :—viz., the extension of advice and assistance to poor mothers in the proper feeding and care of their infants. This involves the appointment of Female Health Visitors.

Most of the information in regard to these cases where assistance would be useful would come through Midwives rather than Medical Practitioners, and it is obviously important that the control of the Midwives and of the Health Visitors should be vested in the same Committee.

It is not, therefore, at present evident whether this Act, if adopted, will be administered by the Health Committee, or by the Watch Committee who at present control the Registration of Midwives.

AMBULANCE SERVICE AVAILABLE IN THE CITY OF BRISTOL.

Property of	Address.	Telephone No.	Telegrams.	Class of Cases Removed.	Office Hours.	Method of obtaining Ambulance.
Corporation of Bristol ..	40 Prince Street	789	"Hygiene. Bristol"	Fevers	9.30–5 ... ... Except { Sat., 9.30-1 Sun., 12-1	By Notification to the M.O.H.
Bristol City and Marine Ambulance Corps	37 Coronation Road	1228 (calls by day and night)	"Ambulance. Bristol"	All except Infectious Diseases	Day and Night ...	By communicating with the Hon. Sec, Capt. J. F. Trezise, 37 Coronation Rd.
Ditto ditto ...	Seamen's Institute, Prince Street	1694 (calls by day and night)	Ditto	Ditto	Ditto	Ditto, or to Rev. Norman de Jersey, Seamen's Institute. Prince Street.
St. John Ambulance Brigade (City of Bristol Corps)	Unity Street, St. Philip	2400 (Ambulance)	"Accident, Bristol"	Ditto	Day and Night ...	By communicating with the Hon. Sec., J. Maynard Froud. Esq.. Transport Station. Unity St., St. Philip.
Bristol Tramway & Carriage Company	Brunswick Square Depôt ...	335	Cab (Brunswick Sqnare)	Special Cab retained for Infectious Diseases	Ditto	Ring up or Wire.

The St. John Ambulance Brigade deals with the Street Casualties ; the Bristol City and Marine Ambulance Corps deals with the Dock work, Bristol South, and Subscribers.

Health Department.

AMBULANCE RECORD.—1909.

Infectious Cases Removed.

Month.	Cases Removed (Total).	Cases Removed (Average Daily).	Journeys.	Mileage (Total).	Mileage (Average Daily).
January ..	81	2·6	60	851	27·4
February ..	102	3·6	65	883	31·5
March ..	84	2·7	60	851	27·4
April ..	77	2·5	54	707	23·5
May	87	2·8	58	761	24·5
June ..	89	2·9	53	734	24·4
July ..	73	2·3	49	658	21·2
August ..	68	2·1	53	690	22·2
September	72	2·4	52	677	22·5
October ..	91	2·9	65	831	26·8
November	86	2·8	61	817	27·2
December..	63	2·0	46	674	21·7
(Totals)	973	2·63 (Average Daily).	676	9,134	25·02 (Average Daily).

DISINFECTION STATION AND AMBULANCE SERVICE.

The Disinfection Station is on the site formerly occupied by the City Small-pox Hospitals in St. Philip's Marsh, and the buildings now comprise :—

(1) Disinfecting Block containing two Steam Disinfecting Machines, Receiving Room, Clearing Room, and a Boiler House.

These rooms have been erected for some years, and are sufficient for the purpose, except that the Boiler House would be more convenient if a little larger. No laundry is attached, as this was deleted from the original plans.

(2) The new stable buildings, completed in 1906, comprise stalls for eight horses and two loose boxes. The stabling is of modern construction, fairly lighted and well ventilated, and has enough accommodation to meet the requirements of the Ambulance and Disinfecting Services. Near to the stable is a small forage room, and a harness room which is also used as a mess room, and offices.

The stable was so designed that conversion to a motor house would be simple and inexpensive.

The old sheds have been enlarged and adapted to serve as coach house and cart shed.

It is contemplated to remove the Ambulance Service from Clift House Stables, where there is cottage accommodation for both the ambulance driver and the stableman.

In October of this year, a Motor Van commenced running for the collection of infected articles. This Motor Van displaced the services of two drivers, and also dispensed with the work of two horses. It is worked in

conjunction with a horse delivery cart for the return of articles after disinfection. Only one horse is now attached to the Disinfecting Service. The caretaker of the Disinfecting Station is driver of the motor van.

This year witnessed the completion of the following accommodation, and the Ambulance Nurse and the Caretaker have been in residence since October :—

CARETAKER.—(Ground Floor)—Sitting-room and office, kitchen, scullery, offices, &c.

(First Floor)—One bedroom and use of bathroom, &c.

AMBULANCE NURSE.—(First Floor)—One sitting-room, one bedroom, and use of bathroom, &c.

ISOLATION ROOMS, under the Infectious Disease (Prevention) Act—Four rooms, viz. :—

(Ground Floor)—Kitchen sitting-room, scullery, bath room, offices.

(First Floor)—Two bedrooms.

This accommodation is provided in one building ; the Isolation Rooms being self-contained and under the supervision of the Caretaker.

VACCINATION.

The 1908 returns are the last complete ones available. I am indebted to the Clerk of the Bristol Union for the following information:—

	Bristol Union.
Vaccination.	
Number successfully vaccinated up to 31st January, 1910.....	4,649
Insusceptible.....	40
Died unvaccinated	820
Postponed by Medical Certificate	166
Certificates of Conscientious Objection	1,052
Removed to Districts, the Vaccination Officer of which has been duly apprised	175
Cases left and not traceable.....	770
In abeyance	964
Births registered in 1908	8,636
*Percentage of successful vaccination to births	53·83

* A special return of Certificates of successful primary vaccinations at all ages received in each of the calendar years 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, and 1908 was furnished at the request of the Local Government Board, and showed as follows:—Certificates received in 1900, 5,917; in 1901, 5,776; in 1902, 6,8 8; in 1903, 6,972; in 1904, 7 413; in 1905, 7,253; in 1906, 6,870; in 1907, 6,404; in 1908, 5,092; and in 19 9, 5,377.

***Bristol Union.**—Summary of persons relieved on the following dates: the first named date (1st April, 1898) being the date of the formation of the Union for the City and County of Bristol.

	1st April, 1898.	1st April, 1899.	1st April, 1900.	1st April, 1901.	1st April, 1902.	1st April, 1903.	1st April, 1904.	1st April, 1905.	1st April, 1906.	1st April, 1907.	1st April, 1908.	1st April, 1909.	1st April, 1910.
In Workhouses and Children's Homes	2,357	2,281	2,305	2,408	2,355	2,388	2,513	2,578	2,528	2,653	2,745	2,855	2,944
In Institutions, &c.	114	116	127	127	148	155	149	159	146	148	135	125	123
In Lunatic Asylums	826	824	810	830	847	856	859	869	875	881	863	881	859
Out-door poor ...	7,796	6,409	5,847	5,837	5,845	5,829	6,030	6,425	6,116	5,921	5,696	5,585	5,764
	11,093	9,630	9,089	9,202	9,195	9,228	9,551	10,031	9,665	9,603	9,439	9,396	9,690
Weekly cost of Out-relief	£724 6 1	£683 14 11¾	£644 14 7	£662 18 4¾	£697 16 9½	£710 0 10½	£746 4 3½	£803 19 8	£792 12 2½	£765 14 1½	£756 8 3	£765 13 4	£785 6 5

* The Union was much increased in area and population in October, 1904.

Medical Officer of Health's Department.

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Clerical Returns.

Number of letters and documents received at and despatched from the Office.

	1904 Estimated for Special Report.		1905		1906		1907		1908		1909	
	In.	Out.	In.	Out.	In.	Out.	In.	Out.	In	Out	In.	Out.
M.O.H. ..	4,481	5,490	10,603	15,104	9,124	8,727	9,417	8,475	9,000	8,144	10,420	12,742
Infectious Disease	20,037	36,605	14,280	19,859	12,488	17,990	14,519	20,874	11,496	16,177	10,704	13,977
Hospitals	2,816	3,465	3,025	2,810	3,214	3,055	4,746	3,833	3,290	3,111	4,604	4,850
Inspectors	3,485	2,656	6,250	5,959	5,802	4,505	5,943	4,201	4,124	3,744	5,689	5,357
Port ..	633	1,058	962	1,003	1,056	957	1,768	1,905	1,337	1,670	3,237	3,636
Total ..	31,452	49,274	35,120	44,735	31,684	35,234	36,393	39,338	29,247	32,846	34,654	40,562
	80,726		79,855		66,918		75,731		62,093		75,216	

In 1904–05, a large amount of correspondence and the distribution of many thousand Circulars in connection with the adoption of Notification of Phthisis, caused a considerable increase in the output figures.

1909—1910.

Baths and Wash-houses.

The following figures are returned for the year's work :—

Year ended 25th March, 1910.	No of Bathers. Swimming Baths.	Private Baths.	Women Washing Clothes.
"Victoria," Clifton (Baths only)	15,526	2,331	...
"Royal," Kingsdown (Baths only)	48,548	...	...
Broad Weir	36,217	25,675	15,484
Mayor's Paddock, New Cut	37,119	24,609	11,535
Jacob's Wells (Baths only)	44,944	19,831	...
Rennison's (Swimming Bath only)	11,228	...	...
Barton Hill	68,306	29,013	...
Eastville Park (Swimming Bath only)	14,660	...	...
Victoria Park (Swimming Bath only)	8,334	...	...
Greville Park (Swimming Bath only)	7,807	...	...
Total ...	292,689	101,459	27,019

1908-9	285,316	103,934	29,134
1909-10	292,689	101,459	27,019
	+ 7,373	+ 2,475	- 2,115

(Up to March 25th, 1910).

Particulars supplied by Mr. J. KANE.

Mr. Edward Russell, B.Se., F.I.C., City Analyst, has kindly supplied the following returns for 1909.

"FOOD AND DRUGS ACTS."

During the year 1,301 samples were submitted for analysis ; of these, 1,300 were received from the Inspeetor, and one was sent by a private individual.

The following Tables show the nature and number respeetively of the samples submitted, with the number reported genuine and the number adulterated :—

Number of samples	examined	1,301
,, ,, ,,	genuine	1,180
,, ,, ,,	adulterated.. ..	121

Article.	Number Examined	Number Genuine	Number Adulterated.	Per cent. Adulterated.
Milk	636	542	94	14·78
Milk (skim)	16	10	6	37·51
Butter	311	300	11	3·48
Margarine	32	32	6	0
Cheese	26	26	0	0
Cream	5	5	0	0
Lard	7	7	0	0
Spirits	50	46	4	8·0
Sugars	26	26	0	0
Wheaten and other Flours	34	34	0	0
Vinegar	14	10	4	28·5
Coffee	17	17	0	0
Coffee and Chicory Extract	8	8	0	0
Cocoa and Chocolate	5	5	0	0
Pepper	13	13	0	0
Mustard	8	8	0	0
Mustard Compound	2	2	0	0
Tea	10	10	0	0
Mineral Waters	6	6	0	0
Meats and Soups	2	2	0	0
Egg Powder	4	4	0	0
Lemonade Powder	4	4	0	0
Baking Powder	1	1	0	0
Ginger Bread	6	6	0	0
Drugs	40	38	2	5·0
Milk Colouring Fluid	1	1	0	0
Residue in Jam Jar	1	1	0	0
Jellies	3	3	0	0
Mixed Herbs	1	1	0	0
Ice Creams	4	4	0	0
Plums	1	1	0	0
Milk Pudding Powder	1	1	0	0
Beer	6	6	0	0
	1301	1180	127	9·7

The working of these Acts in the City of Bristol is entrusted to an Inspeetor aeting under the Wateh Committee and is not administered by the Health Committee.

METEOROLOGICAL OBSERVATIONS AT BRISTOL. 1909.

JANUARY.—This month proved quite a model for winter time, the opening and closing ten days being especially fair and quiet, owing to the presence of large anti-cyclonic systems in the neighbourhood of our islands. In some respects, however, these two periods showed strong contrasts ; the earlier one being somewhat unduly warm and mild, while the later high pressure system brought a long succession of sharp frosty nights and frequent fogs.

The mean temperature (max. and min.) was 38·8 degrees, this being just the average. The maximum reading was 50 degrees on the 2nd and 10th, and the minimum 23 degrees on the 28th—an extreme range of 27 degrees. The warmest day occurred on the 2nd, with a mean temperature of 47·5 degrees ; and the coldest on the 27th, mean 28 degrees. Thirteen frosty nights were experienced.

The total rainfall varied from 1·58 inches at Clifton to 1·36 inches at Frampton Cotterell, falling upon 14 and 12 days respectively. These amounts show a deficiency of 1½ inches.

Mean atmospheric pressure at 9 a.m. was 30·206 inches, a value far above the normal. The maximum reading was 30·720 inches on the 4th, and the minimum 29·382 inches on the 15th.

FEBRUARY.—Although this month bears a very bad character in respect to its rainfall, it is, on the average, one of the driest of the twelve. Still it is not often that it brings so small a fall as during this visit, there having locally only been five previous years in which a smaller total was recorded. The month was also noteworthy for its large amount of sunshine, and also for the great range of temperature during its concluding half.

The mean temperature was 37·6 degrees, a deficieney of over two degrees and over four below that of the month in 1908. The maximum was 52 degrees on the 21st, and the minimum 24 degrees on the 19th and 21st—a range of 28 degrees. The warmest day was the 4th, with a mean temperature of 48 degrees ; and the eoldest the 25th, mean 31 degrees. Twenty frosty nights were experienced in this locality.

The rainfall recorded at Clifton was 0·63 inch, and at Frampton Cotterell 0·55 ineh ; falling upon 7 and 6 days respeetively. These amounts only come to about a quarter of the usual quantity.

Mean atmospherie pressure was 30·171 inches, this valne being much in excess of the average. The highest reading was 30·547 inches on the 15th, and the lowest 29·449 ineh̆es on the 10th.

March.—This month opened with some of the severest wintry weather experienced since February, 1895, the cold eontinuing so far into the month that it seemed probable that it would prove the coldest Mareh for half a century or more. As is so often the case, however, a change occurred when least expeeted, just before the first day of spring, whieh enabled the month to boast of a slightly higher mean temperature than it possessed in 1883 or 1867.

The mean temperature was 38 degrees, just 4½ degrees below the normal. The maximum recorded at Clifton was 54 degrees on the 27th and 29th, and the minimum 17 degrees on the 5th—a range of 37 degrees. At Frampton Cotterell a reading of 11 degrees was recorded on the 5th ; this value eonstituting a record locally since February, 1895. Ten frosty nights were experienced.

The total rainfall amounted to 3·59 inches on 23 days at Clifton, and to 2·92 inches upon 21 days at Frampton

Cotterell. These values show an excess of about an inch.

Mean atmospheric pressure was very deficient, the reading for 9 a.m. being as low as 29·547 inches. The maximum was 30·061 inches on the 12th, and the minimum 29·161 inches on the 19th.

April.—After a very cold commencement, a decided rise of temperature set in under the influence of brilliant and continuous sunshine, a maximum of 70 degrees being reached on the 9th and 10th. Typical April weather followed with a seasonable temperature, this lasting until the closing day, when a cold wave spread over the country.

The mean temperature was 48·5 degrees, 1 degree above the average. The maximum was 71 degrees on the 10th, and the minimum 29 degrees on the 2nd—a range of 42 degrees. At Frampton Cotterell the warmest day was the 24th, with a mean temperature of 52·7 degrees; and the coldest the 2nd, mean 37·3 degrees. There were nine frosty nights locally.

Mean atmospheric pressure was 29·996 inches, a value slightly above the normal. The maximum at 9 a.m. was 30·470 inches on the 2nd, and the minimum 29·518 inches on the 24th.

May.—The visit of this month was a memorable one, commencing as it did with thirteen consecutive days of almost continuous sunshine; while throughout the remainder of the month there were many more, and not one in this locality which was altogether overcast. The nights, however, were very cold for the time of year, frosts being very frequent in various parts of our islands during the first three weeks, after which the night temperatures became more seasonable.

The mean temperature was 54·5 degrees, one degree above normal. The maximum was 80 degrees on the 21st,

and the minimum 33 degrees on the 2nd—a range of 47 degrees. The warmest day occurred on the 21st, with a mean temperature of 65·5 degrees ; and the coldest on the 1st, mean 42·5 degrees. At Frampton Cotterell three frosty nights were recorded.

The rainfall varied from 1·77 inches at Clifton to 1·47 inches at Frampton Cotterell, falling upon 7 and 5 days respectively. These values show a deficiency of about half an inch.

The mean pressure at 9 a.m. was 30·107 inches, a value considerably above the normal. The maximum reading was 30·412 inches on the 3rd, and the minimum 29·424 inches on the 26th.

JUNE.—This month which should perhaps have been the most pleasant of the twelve, possesses a record which had best be forgotten ; proving, as it did, the coldest and most inclement summer month of recent years. Only four days of bright sunshine occurred throughout its visit against twenty-one in May ; while there were nine occasions when the sun was not seen throughout the twenty-four hours.

The mean temperature was 55 degrees—no less than 4½ below the normal, the month being the coldest June for 37 years. The maximum reading was 71 degrees on the 17th and 18th, and the minimum 42 degrees on the 8th—a range of 29 degrees. The warmest day was the 18th, with a mean temperature of 64 degrees ; and the coldest the 3rd, mean 48 degrees.

The rainfall at Clifton amounted to 4·07 inches and at Frampton Cotterell to 3·78 inches, falling upon 16 days. With the exception of 1905 when at Clifton 4·28 inches fell, it was the wettest June in this locality since 1879, in which year over five inches were registered.

Mean pressure at 9 a.m. was 29·983 inches, a value

slightly below the normal. The highest reading was 30·401 inches on the 18th, and the lowest 29·419 inches on the 24th.

JULY.—This month opened under the most promising conditions, for at last the long delayed anti-cyclone had come to our islands. Its visit, however, was of the briefest, for by the 3rd its centre had passed away to the southward, and windy, cold and showery weather had once more become general. This type of conditions lasted practically right through the month, and although a decided improvement upon its predecessor, it must rank as the most inclement July that the present century has so far produced.

The total rainfall varied from 3·30 inches at Clifton to 2·04 inches at Frampton Cotterell, falling upon 16 days. At Clifton the fall exceeds the average by 0·38 inch.

The mean temperature was 60·5 degrees, being 1·6 degrees under the average. The highest reading was 73 degrees on the 2nd, and the lowest 48 degrees on the 1st—showing a range of only 25 degrees. The warmest day occurred on the 30th, with a mean temperature of 65·5 degrees, and the coldest on the 7th, mean 57·5 degrees.

Mean atmospheric pressure was 29·964 inches, a value slightly deficient. The maximum reading was 30·340 inches on the 20th, and the minimum 29·482 inches on 25th.

AUGUST.—This month brought a very pleasant surprise, for apart from a heavy day's rainfall on the 1st, no rain whatever fell over the greater part of our southern counties until the 17th, while the weather was continuously warm and brilliantly sunny. Unfortunately with the setting in of rain on the 17th, the summer may be said to have closed, for the temperature did not again touch 70 degrees; the closing days especially being exceptionally cold.

The mean temperature was 61·8 degrees, about normal. The maximum was 79 degrees on the 7th and 12th, and the minimum 42 degrees on the 31st—an extreme range of 37 degrees. The warmest day was the 15th, with a mean temperature of 70 degrees ; and the coldest the 31st, mean 54·5 degrees.

The rainfall at Clifton amounted to 2·79 inches, and at Frampton Cotterell to 2·54 inches ; falling upon 10 and 9 days respectively. These amounts show a local deficiency of about three-quarters of an inch.

Mean pressure at 9 a.m. was 30·016 inches, this value being above the average. The highest reading was 30·295 inches on the 5th and 11th ; and the lowest 29·425 inches on the 18th.

September.—A cool, dull, and cheerless month, with no continuance whatever of bright sunshine, although several times there seemed almost a certainty that a spell of really settled weather was before us. One singular feature was the fact that the later portion was much warmer than the earlier part. Seeing that at this season of the year, the opposite is usually the case for very obvious reasons, and that the month was cool throughout, it shows how unusually cold the first half was.

The mean temperature was 54·7 degrees, this being twelve degrees under normal, The maximum recorded was 68 degrees on the 18th and 20th, and the minimum 40 degrees on the 2nd—a range of 28 degrees. The warmest day was the 6th, with a mean temperature of 60·5 degrees, and the coldest the 8th, mean 47·5 degrees.

Rainfall varied locally from 3·08 inches at Clifton to 3·30 inches at Frampton Cotterell ; falling upon 17 and 15 days respectively. These amounts show the fall to be about the average.

Mean atmospheric pressure at 9 a.m. was 30·056 inches, this value being well above the average. The maximum recorded was 30·342 inches on the 14th, and the minimum 29·689 inches on the 7th.

October.—As a rule this month brings to this portion of our islands the heaviest monthly rainfall of the twelve, and in this visit it acted fully up to this characteristic; rainfalls being heavy and persistent throughout. Apart from its large rainfall the month was remarkable as in 1908 for its exceptional warmth. Towards the close, however, a decided change in this respect set in, the mean of the closing days being as low as that of a mid-winter month.

The mean temperature was 52·3 degrees, a value over three above the average, but still 2½ below that of October, 1908. The maximum recorded was 68 degrees on the 2nd, and the minimum 29 degrees on the 31st—a range of 39 degrees. The warmest day was the 2nd, with a mean temperature of 62·5 degrees; and the coldest the 30th, mean 38 degrees. Two frosty nights were observed locally.

The total rainfall varied locally from 6·06 inches at Clifton to 5·46 inches at Frampton Cotterell; falling upon 25 days. The excess exceeds two inches.

Mean pressure was 29·797 inches, these figures being much below the normal. The greatest pressure at 9 a.m. was 30·290 inches on the 9th, and the least 29·362 inches on the 5th.

November.—After the persistent rain and wind of October a most welcome period of bright, quiet, and dry weather followed during this month; the very opposite in type to that popularly associated with its character. Its record of bright sunshine indeed was most remarkable, this exceeding that registered during either June or

September. Unfortunately the anti-cyclonic conditions were not to outlive the month, for during its closing days a vast cyclonic system enveloped our islands from the north-westward, and the weather became wet, stormy, and thoroughly unsettled.

The mean temperature was 41·2 degrees; nearly 2½ below the average, and over 5 below that of the month in 1908. The maximum was 56 degrees on the 5th, and the minimum 26 degrees on the 23rd—a range of 30 degrees At Frampton Cotterell 12 frosty nights were recorded. The warmest day occurred on the 5th, with a mean temperature of 51·5 degrees; and the coldest on the 23rd, mean 33 degrees.

The total rainfall recorded was 1·56 inches at Clifton, and 1·32 inches at Frampton Cotterell; falling during 11 and 9 days respectively. These amounts are less than half the usual quantity.

Mean atmospheric pressure was much above the average, the corrected figures at 9 a.m. being 30·075 inches. The maximum recorded was 30.484 inches on the 24th, and the minimum 29·405 inches on the 30th.

December.—This month opened with a great and destructive cyclonic storm on the 2nd and 3rd, following which the weather continued very unsettled to the end of the year. Very wintry conditions prevailed in the third week, which seemed to portend the advent of a real "old fashioned" Christmas-tide. However this was not to be, for an unexpected change to warmth occurred during the night following the 21st, the temperature in 24 hours rising no less than 31 degrees, and mild conditions continued to the close of the year.

Mean temperature proved slightly above the average, the figures being 39·7 degrees. The maximum observed was 52 degrees on the 27th, and the minimum 23 degrees

on the 21st—a range of 29 degrees. The warmest day was the 27th. with a mean temperature of 49·5 degrees, and the coldest the 20th, mean 30 degrees. Eleven frosty nights were observed at Frampton Cotterell.

The total rainfall locally varied from 5·25 inches at Clifton to 4·53 inches at Frampton Cotterell ; falling upon 22 and 23 days respectively. These amounts exceed the average by nearly two inches.

Mean pressure at 9 a.m. was 29·695 inches ; a value far below the normal. The maximum recorded was 30·431 inches on the 30th, and the minimum 28·707 inches on the 4th.

Looking at the year as a whole, although mainly pleasant and favourable to the end of May, it proved from then onward to its close of the most unpleasant and inclement character. In fact during this long period of seven months the only bright spots were the short burst of summer in the early half of August, and the dry and sunny weather which dominated November.

H. H. HARDING, F.R. Met. Soc.

For the rainfall values at Clifton, and also for those relating to temperature given in the above notes, I am indebted to the courtesy of Mr. R. F. Sturge, F.R. Met. Soc.

The rainfall values for Clifton are taken at an altitude of 215 feet above sea level, and those for Frampton Cotterell at 166 feet.

Meteorology for the 52 Weeks—Continued.

Height above Mean Sea Level—250 *feet.*

CLIFTON COLLEGE.

1909. Week Ending	BAROMETRIC PRESSURE at 30° and Sea Level: Mean	Highest	Lowest	Mean Temperature	Highest Mean Daily Temperature	Lowest Mean Daily Temperature	Max. Temperature in Shade	Min. Temperature at 4ft above ground	Min. Temperature on ground	Mean Daily Range of Thermometer	Greatest Daily Range of Thermometer	Smallest Daily Range of Thermometer	Mean Humidity	Grains of Vapour in a cubic ft. of air	Prevalent Wind.
	Inches	Inches	Inches												
July 3	30·09	30·27	29·94	58·6	62·7	54·7	74·9	47·0	43·9	17·5	24·4	13·7	73	3·92	W.
,, 10	29·90	30·11	29·69	60·2	63·4	57·5	70·2	52·1	46·0	12·1	17·3	5·2	75	4·31	N.W.
,, 17	30·09	30·16	29·94	60·6	62·8	59·0	68·1	50·0	45·4	11·9	18·1	7·0	82	4·64	N.W.
,, 24	30·01	30·31	29·71	61·3	64·2	57·8	70·3	50·7	47·9	11·2	12·2	7·9	7	4·61	N.W.—W.S.W.
,, 31	29·81	29·99	29·59	59·4	62·3	56·3	68·5	49·8	48·0	10·7	15·3	7·3	82	4·77	N.W.
Aug. 7	30·14	30·21	30·07	61·9	67·6	56·4	80·0	47·8	43·4	17·8	26·0	10·2	69	4·31	N.—N.N.W.
,, 14	30·17	30·18	30·02	69·7	74·6	67·4	83·0	54·9	50·9	19·8	26·0	11·7	72	5·30	N.E.—W.
,, 21	29·83	30·12	29·44	63·4	70·7	56·4	83·2	48·9	47·5	13·0	25·0	5·4	81	5·40	S.W.
,, 28	29·84	30·23	29·48	59·3	62·1	55·9	68·2	47·5	45·4	13·5	20·0	6·5	75	4·46	S.W.—W.
Sept. 4	30·05	30·28	29·85	5·3	58·3	51·9	63·9	43·7	39·1	12·2	19·7	4·2	69	3·76	N.W.—W.
,, 11	29·95	30·21	29·72	53·9	59·8	49·3	65·9	42·8	38·4	11·3	17·7	6·2	78	3·77	N.W.—N.E. by E.
,, 18	30·18	30·35	30·04	54·1	55·1	51·5	61·1	47·4	41·1	9·1	13·4	2·1	85	4·04	N.—N.E.
,, 27	30·07	30·22	29·90	57·5	61·8	54·0	67·3	44·5	40·9	13·9	21·8	6·3	88	4·38	N.E.—N.W.
Oct. 2	29·97	30·28	29·63	55·7	57·9	53·5	65·3	49·2	43·6	6·9	11·9	4·9	90	4·40	S.E.—W.
,, 9	29·78	30·29	29·37	55·9	60·6	50·5	66·8	41·6	36·9	12·2	18·5	6·3	87	4·45	S.W.
,, 16	29·84	30·02	29·62	55·3	60·3	52·6	64·0	47·2	42·9	8·8	12·5	4·4	89	4·62	S.—S.W.
,, 23	29·88	30·19	29·50	55·9	58·1	53·5	62·1	48·1	45·7	7·7	10·9	2·7	83	4·17	W.—S.
,, 30	29·78	30·06	29·48	43·8	49·6	38·3	52·1	31·5	27·1	7·6	13·6	4·2	80	2·67	N.E.—N.W.
Nov. 6	30·16	30·34	30·09	45·4	52·2	37·0	55·2	29·2	24·9	11·1	15·6	3·7	90	3·7	N.E.—S.E.
,, 13	30·15	30·40	29·72	42·9	46·6	39·7	51·9	29·4	25·5	12·2	20·7	6·0	82	2·58	N.W.—W.
,, 20	30·01	30·27	29·59	36·9	39·4	34·4	45·3	29·1	28·9	12·2	20·7	6·0	87	2·22	N.E.
,, 27	30·23	30·52	29·96	38·2	44·1	33·4	50·1	27·0	22·1	11·8	13·9	9·2	88	2·36	N.—W.
Dec. 4	29·28	29·86	28·70	45·2	50·4	40·0	53·3	37·4	33·6	7·3	11·7	3·9	87	3·01	S.—W.
,, 11	29·71	30·41	29·09	39·8	49·8	35·2	52·1	29·3	23·7	11·8	21·7	2·5	91	2·68	W.—S.
,, 18	30·07	30·47	29·47	38·2	40·5	35·4	43·9	31·8	29·1	6·9	10·3	2·3	90	2·67	N.E.—W.
,, 25	29·44	29·86	28·92	39·5	50·6	32·7	52·9	23·8	20·1	15·3	27·6	4·7	91G	3·09*	W.—S.W.
1910															
Jan. 1	30·08	30·49	29·69	44·5	48·5	40·6	52·3	34·0	28·2	8·9	14·6	0·0	91	3·18	W.—S.

* Five days only.

Meteorology for the 52 Weeks, ending January 1st, 1910.

Height above Mean Sea Level—250 feet. CLIFTON COLLEGE.

1909. Week Ending	BAROMETRIC PRESSURE at 30° and Sea Level: Mean	Highest	Lowest	Mean Temperature	Highest Mean Daily Temperature	Lowest Mean Daily Temperature	Max. Temperature in Shade	Min. Temperature at 1ft above ground	Min. Temperature on ground	Mean Daily Range of Thermometer	Greatest Daily Range of Thermometer	Smallest Daily Range of Thermometer	Mean Humidity	Grains of Vapour in a cubic ft. of air	Prevalent Wind
	Inches	Inches	Inches												
Jan. 9	30·49	30·79	29·97	42·5	47·8	39·9	49·3	31·6	26·4	7·9	16·7	2·2	89	2·71	W.—N.W.
,, 16	29·69	30·01	29·48	42·1	46·2	37·9	50·1	31·7	28·4	9·1	18·1	3·7	83	2·63	W.
,, 23	30·28	30·58	29·93	37·9	45·5	32·7	50·5	30·7	26·9	7·6	15·5	3·2	87	2·34	N.W.—N.E
,, 30	30·35	30·55	30·15	33·8	43·0	27·1	46·1	22·6	22·9	34·2	37·6	29·6	?	?	E.—W.
Feb. 6	30·05	30·23	29·87	42·9	49·7	37·6	51·4	31·0	26·4	10·1	18·2	3·4	85	2·75	W.—N.W.
,, 13	30·04	30·56	29·44	35·5	39·5	33·7	47·1	29·1	25·9	8·6	15·2	4·9	85A	2·19*	N.E.
,, 20	30·28	30·59	30·04	37·5	40·9	33·2	49·7	24·5	20·8	14·8	23·9	7·1	81H	2·16†	?
,, 27	30·42	30·55	30·25	34·9	38·5	31·9	50·8	24·9	19·8	13·9	22·4	5·0	85C	2·14‡	E.S.E.—N.N.E.
Mar. 6	29·53	29.92	29·19	29·8	32·7	25·7	40·2	19·1	15·8	13·9	20·4	6·9	94D	2·12§	N.E.
,, 13	29.73	30·09	29·22	37·0	39·5	35·1	44·9	32·0	29·4	7·9	11·7	3·0	83	2·04	E.S.E.—N.
,, 20	29·56	29·61	29·19	39·5	47·2	33·9	52·8	25·2	21·4	12·3	20·2	6·0	83E	2·49¶	N.W.W.
,, 27	29·63	29·89	29·26	44·7	50·0	38·8	57·8	31·3	30·7	11·5	20·2	5·8	87	3·06	S.E.—.W.
April 3	29·80	30·56	29·17	45·2	50·6	39·8	53·8	30·9	27·1	9·6	17·9	4·2	86	2·97	S.E.
,, 10	30·31	30·45	30·14	49·9	55·6	45·1	71·3	33·2	29·0	27·1	32·2	14·5	64	2·52	N.E. by E.
,, 17	29·85	30·05	29·69	49·7	53·3	46·1	63·2	40·3	36·9	13·0	19·8	5·9	75	3·22	W.—S.W
,, 24	29·82	30·02	29·55	51·7	52·9	50·0	62·2	39·1	33·3	13·2	21·8	7·0	72	3·18	S.—S.E.
May 1	29·91	30·16	29·68	49·1	53·7	44·3	61·5	36·7	32·0	12·6	15·6	10·2	66	2·82	S.—N.W.
,, 8	30·28	30·43	30·14	52·9	59·2	44·6	71·3	35·2	28·8	22·7	24·7	18·8	58	2·69	S.S.E.—N.E. by E.
,, 15	30·18	30·34	30·07	51·8	57·9	46.2	68·4	36·6	32·1	19·8	25·1	15·1	62	2·76	N.E.—N.
,, 22	30·13	30·33	29·89	56·6	66·0	48·8	81·3	40·4	36·0	22·1	30·6	15·0	63	3·24	W.—S.E.
,, 29	29·90	30·37	29·43	56·8	62·0	52·7	74·0	46·8	42·7	12·9	24·7	6·3	67F	3·44	S.W.—W.
June 5	30·01	30·31	29·82	54·4	64·0	48·8	72·5	44·1	40·2	10·4	16·9	4·7	79	3·77	N.E.
,, 12	30·07	30·17	29·91	52·4	56·3	48·5	66·1	44·2	40·2	11·0	17·3	5·7	77	3·36	N.E.—N.
,, 19	30·32	30·44	30·22	58·9	61·3	56·4	70·3	48·6	44·0	16·2	21·7	10·3	71	3·80	N.
,, 26	29·69	30·07	29·38	55·5	59·5	52·7	63·7	48·2	44·3	8·8	14·9	6·3	82	4·06	S.W.—N.

* Average 5 days. Friday and Saturday. Wet bulb frozen.
† Average 5 days. Friday and Sunday. Wet bulb frozen.
‡ Sunday's reading only. Rest of week wet bulb frozen.
§ 1 day only (Saturday). Wet bulb frozen rest of week.
• 5 days only. Wet bulb frozen Monday and Wednesday.
‖ Average 6 days only.

Rainfall of 1909.

Taken at Clifton College.

Week Ending.	Rain Inches.	Week Ending.	Rain Inches.
January 9	·094	July 17	·380
,, 16	1·138	,, 24	·730
,, 23	·215	,, 31	1·190
,, 30	·025	August 7	·520
February 6	·065	,, 14	Nil.
,, 13	·460	,, 21	1·450
,, 20	·015	,, 28	·370
,, 27	Nil.	Sept. 4	·645
March 6	·885	,, 11	·620
,, 13	·218	,, 18	·030
,, 20	·410	,, 25	·860
,, 27	1·550	October 2	1·390
April 3	·260	,, 9	·985
,, 10	Nil.	,, 16	2·915
,, 17	·455	,, 23	1·165
,, 24	1·895	,, 30	·900
May 1	·760	Nov. 6	·105
,, 8	Nil.	,, 13	·015
,, 15	Nil.	,, 20	Nil.
,, 22	040	,, 27	·160
,, 29	1 595	Dec. 4	2·610
June 5	·805	,, 11	·880
,, 12	.495	,, 18	1·170
,, 19	·300	,, 25	1·235
,, 26	3·105	**1910.**	
July 3	·100	Jan. 1	·290
,, 10	·940		

D. RINTOUL.

Rainfall 1909.

Month.	Rainfall in Inches.	Average of 28 Years.	Departure from Average.	No of days on which ·01 inches or more rain fell
January	1·572	2·610	- 1·038	14
February	0·550	2·138	- 1·588	6
March	3·323	2·356	+ 0·967	21
April	3·130	2·263	+ 0·867	14
May	1·685	2·002	- 0·317	7
June	4·685	2·345	+ 2·340	17
July	3·310	2·778	+ 0·532	20
August	2·720	3·188	- 0·468	10
September ...	2·985	2·671	+ 0·314	15
October	6·155	3·886	+ 2·269	24
November	1·470	2·886	- 1·416	8
December	5·135	3·432	+ 1·703	23
	36·720	32·555	+ 4·165	179

D. RINTOUL.

PART III.

CITY HOSPITALS.

Report of the General Medical Superintendent (Administrative).

The tabular statement "Isolation Hospital Accommodation in Bristol since 1886," shows incidentally the vicissitudes through which hospital accommodation for infectious cases has passed, and makes it clear how we now have less available beds per head of population than we had 24 years ago.

The difference between then and now may be summed up thus :—

Then there were seven beds per 10,000 population, the majority of beds were provided by the Guardians, the population to be served was only 214,000 persons.

Now there are only four beds per 10,000 population at full cubic space (2,000 cubic feet), all the beds are in the hands of the Sanitary Authority, the population to be served is 377,000 persons.

The advantages gained now are concentration in administration, not only in regard to notification and removal of cases, but in regard to the Hospitals in use ; and the substitution in great part of well-equipped and well-nursed permanent Hospital Blocks for ill-equipped and inefficiently nursed temporary wooden structures.

The disadvantages are, the assumption of responsibility for isolation of cases formerly provided for by the Guardians, and for isolation hospital provision for a larger population ; without a corresponding pro rata increase in the number of beds.

The success achieved in avoiding disastrous epidemics is quoted in evidence of the sufficiency of the present beds, but this view loses sight of the immense strain thrown on the personal factor in mobilising insufficient forces, and is at best commendation of the triumph of administration over means.

No other large town is content with a less ratio of isolation beds to population than one per thousand.

A temporary lull in notifications in the autumn of 1908 led to the closing down of Novers Hill Hospital with a minimum staff; a step the unwisdom of which was emphasised by the January, 1909, outbreak of virulent Small-pox. However, the Matron, by excellent management, averted disaster.

Quite recently, too, the permanent closure of Clift House has made a perceptible difference in the necessary elasticity of our available isolation accommodation; and the actual dilapidation of the original buildings on the Novers Hill site accentuates a deficiency already sufficiently marked.

The necessity for bringing up the available accommodation for the defence of the City to at least the figure which obtained 24 years ago may without exaggeration be described as urgent.

I am, Gentlemen,
Your obedient Servant,
D. S. DAVIES, M.D.,
General Medical Superintendent City Hospitals.

ISOLATION HOSPITAL ACCOMMODATION IN BRISTOL SINCE 1886.

	Guardians.	St. Philip.	St. George.	Clift House.	Novers Hill.	Ham Green.	Population of City.	Total Beds.	Proportion of Beds per 1,000 Population.
1886	120	28					214,000	148	0·7
1894	60	48		30	50		226,000	188	0·8
1898	60	Closed.	6	Closed.	50		316,000	116	0·3
1900	Closed.	24	6	22	50	76	324,000	156	0·5
1901		24	Closed.	22	35	76	329,000	157	0·4
1902		Closed.		22	35	76	334,000	133	0·3
1905				22	35	134	358,000	191	0·5
1906				Closed.	35	134	363,000	169	0·4
1909					35	134	377,000	169	0·4

CITY HOSPITAL, HAM GREEN, BRISTOL.

Report of the Resident Medical Officer for the Year 1909.

To the Members of the Committee of Management.

Gentlemen,

I have the honour to submit to you the Eleventh Annual Report, dealing with the work of the above Hospital, for the statistical year ending January 1st, 1910.

There were 114 patients in Hospital at the beginning of the year, 853 patients were admitted, 841 discharged well, and 28 died, thus leaving 98 patients in Hospital at the end of the year.

The admissions numbered 76 more than in the preceding year, this being due to the larger number of cases of Scarlet Fever admitted.

The average daily number of patients in Hospital was 128·4 which is much higher than in the preceding year. The highest daily number was 152 on June 18th, and the lowest 98 on the last day of the year.

The average length of stay in Hospital of patients who recovered was 55·5 days, of fatal cases 12·5 days.

The average death-rate among the patients for all diseases was 3·2 per cent.; five deaths occurred within 48 hours of admission to Hospital, if these be excluded, the corrected mortality rate becomes 2·6 per cent.; both these rates which are lower than those of 1908 must be considered satisfactory. It must be remembered, however, that the death-rates will vary from time to time according to the virulence of the prevailing outbreak.

Statistical tables are appended, showing the diseases treated, mortality rates, complications observed and other particulars.

SCARLET FEVER.

Fifty-one cases were in Hospital at the beginning of the year ; 414 cases were admitted (including three cases notified as Diphtheria) ; 420 cases were discharged well, and nine died, thus leaving 36 cases in the Hospital at the end of the year.

Removal to Hospital was effected in 86 per cent. of the cases during the first week of illness, compared with 88 per cent. last year.

Age Incidence.—Of the patients admitted 26·2 per cent. were under 5, 44·3 per cent. between 5 and 10, 21·2 per cent. between 10 and 15, and 8·3 per cent. over 15 years of age.

The average length of stay in Hospital of patients who recovered was 60·1 days ; of fatal cases 17. The longest stay of any one patient was 150 days.

The chief causes of long detention in Hospital were Rhinorrhœa, Otorrhœa, and tardy Desquamation.

Fatality Rate.—Calculated on the discharges, the fatality rate was 2·0 per cent. One death occurred within 48 hours of admission making the corrected fatality rate 1·8 per cent. The rate in males was rather lower than that in females.

All the deaths, with one exception, occurred in patients under eight years of age.

Symptoms and Diagnosis.—The type of the disease was generally speaking mild. About 93 per cent. of the patients suffered from Scarlatina Simplex, six per cent. from Scarlatina Anginosa, and 0·7 per cent from Scarlatina Maligna.

Of 40 cases notified as Scarlet Fever, 11 were cases of Scarlet Fever and Diphtheria, 12 German Measles, 4 Measles, 4 Tonsillitis, 3 Nil, 2 Cervical Adenitis, 1 Diphtheria, 1 Scarlet Fever and Whooping Cough, 1 Syphilis, and 1 Pneumonia.

Cause of Death.—Of the deaths, 6 resulted from Toxæmia and Syncope and 3 from complications, viz., 2 from acute Nephritis and 1 from Pericarditis.

Complications.—Rhinorrhœa was marked in 37 cases, in 19 of which the Diphtheria Bacillus was found in free growth; these cases of course needed strict isolation, and put extra strain upon the Hospital isolation accommodation. Otorrhœa occurred in 63 cases, in 24 of these the right, in 22 the left, and in 17 both ears were affected.

Cervical Adenitis was severe in 11 patients, and in 9 of these Abscess supervened. Cervical Cellulitis occurred in one case.

Albuminuria, variable in duration and occurring chiefly during convalescence was found in 11 cases. True *Nephritis* was noted in 14 patients. *Scarlatinal Rheumatism* was marked in 10 cases, in two of which heart mischief resulted. *Bronchitis* occurred in two cases, and *Pneumonia* in one.

Mastoid Abscess occurred in one case. Five distinct cases of *Relapse* occurred, and in seven cases patients suffered from *Onychia*. One patient was admitted with *Purulent Ophthalmia*—streptococcal in nature—which ended in destruction of one eye.

Sequalæ.—Four patients were discharged with slight Otorrhœa, and one with slight Albuminuria after Nephritis.

"Return" Cases.—Infection was apparently carried home in the case of 12 patients out of a total of 449 discharges, giving a "return" case rate of 2·7 per cent

The average length of stay in Hospital of the infecting cases was 56 days, and the average interval between the return home of the patient and the "return" case eight days. Nine of the infecting patients had uncomplicated attacks, whilst one patient each had suffered from Otorrhœa, Rhinorrhœa, and Rhinorrhœa and Otorrhœa.

DIPHTHERIA.

Fifty-eight cases were in Hospital at the beginning of the year; 359 were admitted (including one case sent in as Scarlet Fever). 349 were discharged well, and 14 died, thus leaving 54 patients in Hospital at the end of the year.

Removal to Hospital was effected in 88 per cent. of the cases, where a definite history of onset could be ascertained during the first week of the illness, as compared with 85 per cent. in 1908, but only 40 per cent. were admitted on or before the fourth day of the disease, up to which time the good effects of Antitoxin are so marked.

The average day of the disease on admission in cases which proved fatal was the fifth.

The Diphtheria Bacillus was found before admission in 292 out of 386 cases notified as Diphtheria; of the other 94, in 58 no swab was taken, in 16 the swab was negative, and in 20 the swab contained suspicious organisms.

Age Incidence.—Of the patients admitted, 24·9 per cent. were under 5 years of age, 42·7 per cent. between 5 and 10, 17·7 per cent. between 10 and 15, and 14·6 per cent. over 15.

The average length of stay in Hospital of cases which recovered was 51·1 days, of fatal cases eight days. The longest stay of any one patient was 221 days.

Paralysis of various parts and the persistence of the

organism in the nose, throat, or ear, were chiefly responsible for long detention.

Fatality Rate.—Calculated on the discharges the fatality rate was 3·8 per cent. Three deaths occurred within 48 hours of admission; if these be excluded the rate becomes 3 per cent. The death rate in females was more than double that in males. 57 per cent. of the deaths occurred in patients under five, 85·7 per cent. in patients under 10, and 14·3 per cent. in patients over 10 years of age.

As a number of patients harbouring the Diphtheria Bacillus, but with few clinical symptoms, are included in the discharges, the cases have been divided into two classes :—

1.—272 cases with clinical symptoms, in which the fatality rate was 4·8 per cent.

2.—77 cases chiefly of the nasal variety, in which the fatality rate was nil.

Symptoms and Diagnosis.—The disease was confirmed bacteriologically before admission in 292 of the 386 cases notified as Diphtheria; of six other cases notified as Diphtheria on a positive bacteriological result three were found to be cases of Measles and Diphtheria, two Scarlet Fever and Diphtheria, and one Diphtheria and Whooping Cough.

Of 58 cases in which no swab was taken 47 were clinically Diphtheria, four were cases of Rhinitis, two were Scarlet Fever, two Tonsillitis, one Laryngitis, one Scarlet Fever and Diphtheria, and one doubtful.

Of 16 cases in which the swab was negative, 13 were clinically Diphtheria, one was Tonsillitis, one Scarlet Fever and one doubtful.

Of 20 cases in which the swab was suspicious, nine

were clinically Diphtheria, one was a case of Tonsillitis, two Rhinitis, one Laryngitis, six Nil, and one doubtful

The seat of the disease in the 359 cases (including one case sent in as Scarlet Fever) was as follows :—

Throat	240
Throat and Nose	39
Nose	35
Throat and Larynx	22
Ear	16
Throat, Nose and Larynx ..	4
Nose and Eye	2
Eye	1
Total	359

The percentage of cases in which the nose was found affected before admission was 22·2 ; in 33 other throat cases the Diphtheria Bacillus was subsequently found in the nose.

The extension of the disease to the nose generally gives rise to naked-eye signs through which the Diphtheritic nature of the complaint can be diagnosed, although the previous throat condition has been unrecognised. Of 31 patients admitted as suffering from Nasal Diphtheria, in 11 the throat was positive, in 11 negative, and in 9 contained suspicious organisms.

Early Albuminuria was present in 45 per cent. of the clinical cases.

Cause of Death.—Of the deaths 11 were due to Toxæmia and Syncope—these figures emphasize the need for very early injection of Antitoxin in order to avert a fatal result —and three to complications, viz., two to Broncho-pneumonia, and one to Marasmus.

Complications.—Severe Cervical Adenitis was noted in

13 cases, and Cellulitis of the neck in six; Cervical Abscess occurred in four cases.

Otorrhœa occurred in 19 cases.

Epistaxis was severe in three cases, and in five troublesome Vomiting occurred.

Broncho-pneumonia was noted in three cases.

Paralysis occurred in 41 cases.

Nephritis and Relapse occurred in two cases each.

The following Paralyses were observed; Soft Palate in 39 cases, Ciliary Muscle in three, Ocular Muscles in eight, Skeletal Muscle in two, Eye-lid in five, Diaphragm and Face in one case each.

Treatment.—Active local antiseptic treatment was carried out in all cases. Antitoxin was injected into every patient who had deposit on the tonsils, with manifest good results. I am again able to record, in this connection, that no patient developed croupy symptoms after admission to Hospital; further, many patients would have succumbed but for its use.

An Antitoxin Rash was observed in 67 of the clinical cases, or in 33 per cent. of the injected patients; the rash was usually urticarious but at times urticario-papular.

Sixty-six of the patients had received some Antitoxin before admission.

Tracheotomy was performed on two patients, of whom one recovered and one died. Two patients were admitted from the Royal Infirmary and two from the General Hospital after Tracheotomy had been performed, all of whom recovered. The mortality rate after Tracheotomy was thus 16·6 per cent.

During the year 1,806 bacteriological examinations were

performed from cases or suspected cases of Diphtheria, of which 95 were done at the Hospital, and 1,711 by the City Bacteriologist.

ENTERIC FEVER.

Two cases were in Hospital at the beginning of the year, eight cases were admitted and six discharged, leaving four cases in Hospital at the end of the year. No death occurred.

Removal to Hospital.—One patient was admitted during the first week, five during the second and one during the third week of the illness.

The average length of stay in Hospital of the patients was 49 days.

Diagnosis.—Four patients gave a positive Widal reaction before admission ; of the rest in which no reaction was ascertained, two were found positive after admission and the other was well marked clinically. One female patient was admitted in January as a " carrier " for observation and treatment.

One patient notified as a case of Enteric Fever was suffering from Pneumonia.

Complications.—Relapse occurred in three cases.

MIXED INFECTIONS.

A large number of patients during the year were found to be suffering from more than one disease or were incubating a second disease on admission ; these cases unless at once recognised and isolated are a source of great danger to other patients.

The average length of stay in Hospital of such cases was 77 days, of fatal cases 15 days. The longest stay of any one patient was 177 days.

The cases are divided into three groups :—

Group 1.—*Cases notified and admitted as suffering from two diseases.*

Two patients were admitted suffering from Diphtheria and Scarlet Fever, and two from Measles and Diphtheria.

Group 2.—*Cases which were found on admission or shortly afterwards to be suffering from a second disease also, the infection of which was received before admission.*

Eleven patients sent in as cases of Scarlet Fever were found to be cases of Scarlet Fever and Diphtheria, one ending fatally. Three patients sent in as cases of Diphtheria were cases of Measles and Diphtheria, two of them ending fatally. Three patients sent in as suffering from Diphtheria were found later to be cases of Scarlet Fever in Diphtheria "carriers;" as a result two Diphtheria patients developed Scarlet Fever.

One Diphtheria patient was suffering from Chicken-pox also on admission, and one Diphtheria and one Scarlet Fever patient from Whooping Cough, the latter ending fatally. One Scarlet Fever patient was incubating Rötheln (German Measles) on admission. Three Diphtheria patients were incubating Chicken-pox and one Whooping Cough on admission. One Scarlet Fever patient was incubating Whooping Cough and gave rise to four other cases.

Group 3.—*Cases which received the infection of a second disease whilst in Hospital.*

Eight Diphtheria patients developed Chicken-pox. Four Scarlet Fever patients developed Whooping Cough. Two Diphtheria patients developed Scarlet Fever. All made good recoveries.

OTHER DISEASES.

Of 27 patients notified as cases of Scarlet Fever, 12 were suffering from German Measles, four from Measles, four from Tonsillitis, three Nil, two Cervical Adenitis, one Pneumonia, and one Syphilis. Of 18 patients notified as cases of Diphtheria, four were suffering from Tonsillitis, six Nil, six Rhinitis, and two Catarrhal Laryngitis. One patient admitted as Enteric Fever, was found to be a case of Pneumonia. All the above patients needed strict isolation.

The average length of stay in Hospital of cases discharged was 37·7 days.

VACCINATION STATISTICS.

All patients were examined on admission as to their state of Vaccination with the following results :—

Unvaccinated	172
No mark, but said to have been Vaccinated	10
One Mark	228
Two Marks	163
Three Marks	191
Four or more Marks	89
Total..	853

Thus of 853 patients examined 20·1 per cent. were unvaccinated, whilst of those Vaccinated 33·9 per cent. had one mark, 24·2 per cent. had two marks, 28·4 per cent. had three marks, and only 13·2 per cent. had four marks as prescribed by the Local Government Board. In 51 out of 228 patients who had only one mark, the Cicatrix was very small and poorly foveated.

Re-vaccination was found to have been performed on 29 patients.

STAFF ILLNESS.

Three Nurses and three Maids contracted Diphtheria ; one Nurse contracted Scarlet Fever, and another Erysipelas (loss of service 292 days). All made good recoveries.

Other minor illnesses occurred during the year (loss of service 240 days). The total loss of service in time entailed by illness of all kinds amounted to 532 days.

GENERAL.

I have again throughout the year noted all cases of Pediculosis occurring among patients admitted, with the following results :—Out of 853 Males and Females examined 37 per cent. had nits or lice or both in their hair, which required active treatment, and in many cases necessitated cropping the hair ; but whilst 25 per cent. of the Males' heads were dirty, 50 per cent. of the Females' were found so. Two were suffering on admission from Ringworm of the Scalp, seven from Impetigo, four from Scabies, and nine were badly flea-bitten over the body.

During the year 23,948 articles of clothing were disinfected by steam in the Hospital Disinfector.

The Observation Pavilion has proved of great service in dealing with cases of Mixed Infections and diseases other than Scarlet Fever or Diphtheria.

One *post-mortem* was performed during the year to confirm the cause of death.

In conclusion I beg to acknowledge the services rendered by the Matron (Miss Garden), and the good work done by the Nursing and Working Staffs.

I am, Gentlemen,
Your obedient Servant,
JAMES FLETCHER, M.D., D.P.H.,
Resident Medical Officer.

HAM GREEN HOSPITAL.

TABLE I.

Admissions and Discharges during 1909, with the number of Patients in Hospital at the beginning and end of year.

Disease.	Remaining in Hospital at end of year 1908.		Admitted.		DISCHARGED.				Remaining in Hospital at end of Year 1909.	
					Recovered.		Died.			
	M	F	M	F	M	F	M	F	M	F
Scarlet Fever	28	23	204	210	208	212	4	5	20	16
Diphtheria	33	25	166	193	166	183	4	10	29	25
Enteric Fever	2	—	4	4	4	2	—	—	2	2
Mixed Infections	—	—	13	10	11	8	2	2	—	—
Other Diseases	—	3	23	23	19	25	1	—	3	1
Quarantine	—	—	1	2	1	2	—	—	—	—
Totals	63	51	411	442	409	432	11	17	54	44
	114		**853**		**841**		**28**		**98**	

HAM GREEN HOSPITAL.

TABLE II.

Cases Notified as:—	CASES PROVED TO BE																
	Scarlet Fever.	Diphtheria.	Enteric Fever.	Scarlet Fever & Diphtheria.	Measles and Diphtheria.	Quarantine.	Scarlet Fever & Pertussis.	Diphtheria and Pertussis.	Rötheln.	Nil.	Tonsillitis.	Rhinitis.	Measles.	Adenitis	Catarrhal Laryngitis.	Pneumonia.	Syphilis.	Totals.
Scarlet Fever (451)	411	1	..	11	..	..	1	..	12	3	4	..	4	2	..	1	1	451
Diphtheria (386)	3	358	..	3	3	..	..	1	..	6	4	6	..	..	2	..	..	386
Enteric Fever (9)	..	..	8	..	..	..	..	..	..	..	..	..	..	..	..	1	..	9
Scarlet Fever & Diphtheria (2)	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Measles and Diphtheria (2)	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	2
Quarantine (3)	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	3
	414	359	8	16	5	3	1	1	12	9	8	6	4	2	2	2	1	853

HAM GREEN HOSPITAL.

TABLE III.

Monthly admissions and average daily number in Hospital.

1909.	Scarlet Fever.		Diphtheria.		Mixed Infections.		Enteric Fever.		Other Diseases and Quarantine.		Average Daily No. in Hospital in each Month
January ...	25		41		1		2		0		112·7
February ..	43	115	34	91	2	5	0	2	8	16	133·8
March ...	47		16		2		0		8		140·4
April ..	37		25		2		1		4		134·3
May ..	51	133	24	90	3	5	0	1	2	8	128·7
June ..	45		41		0		0		2		145·5
July ..	42		19		1		0		5		137·4
August ..	27	98	22	64	2	9	0	2	2	13	127·4
September...	29		23		6		2		6		115·8
October .	30		41		4		1		4		118·4
November ...	22	68	44	114	0	4	0	3	5	12	136·9
December ...	16		29		0		2		3		110·6
Year 1909	414		359		23		8		49		128·4

HAM GREEN HOSPITAL.

TABLE IV.

Showing Ages and Sexes of Patients Discharged during the year 1909, with the Fatality Rate.

Scarlet Fever.

Age.	MALE. Recovered.	MALE. Died.	MALE. Fatality per cent.	FEMALE. Recovered.	FEMALE. Died.	FEMALE. Fatality per cent.	TOTAL. Recovered.	TOTAL. Died.	TOTAL. Fatality per cent.
0–1 ..	3	...	..	...	...	...	3	...	..
1–2 ..	6	...	..	6	..	...	12	...	..
2–3 ...	14	1	7·1	7	1	12·4	21	2	8·6
3–4 ...	19	...	...	15	...	...	34	..	..
4–5 ...	19	2	9·5	21	1	4·5	40	3	6·9
5–6 ...	17	...	..	26	...	...	43	..	...
6–7	22	1	4·3	31	...	...	53	1	1·8
7–8 ...	17	...	...	21	2	8·6	38	2	5·0
8–9 ...	17	..	...	12	..	...	29	..	...
9–10 ...	11	...	..	12	...	...	23	...	...
10–15 ...	46	..	...	43	1	2 2	89	1	1·1
15–20 ...	13	..	...	7	...	...	20	...	...
Over 20 ...	4	...	...	11	...	...	15	...	...
Totals...	208	4	1·8	212	5	2·3	420	9	2·0

Diphtheria.

Age.	MALE. Recovered.	MALE. Died.	MALE. Fatality per cent.	FEMALE. Recovered.	FEMALE. Died.	FEMALE. Fatality per cent.	TOTAL. Recovered.	TOTAL. Died.	TOTAL. Fatality per cent.
0–1 ...	4	...	...	..	1	100·0	4	1	20·0
1–2 ...	5	1	16·6	3	...	...	8	1	11·1
2–3 ...	8	...	...	7	...	...	15	..	...
3–4 ...	16	..	...	14	2	12·5	30	2	6·2
4–5 ...	12	1	7·6	18	3	14·2	30	4	11·7
5–6 ..	33	...	...	20	2	9·0	53	2	3·6
6–7 ...	15	...	...	21	1	4·5	36	1	2·7
7–8 ...	9	...	...	14	...	...	23	..	...
8–9 ...	11	...	....	13	1	7·1	24	1	4·0
9–10 ...	5	..	...	8	...	...	13	...	...
10–15 ...	29	1	3·3	33	...	...	62	1	1·5
15–20 ...	10	1	9·0	17	...	...	27	1	3·5
Over 20 ...	9	...	...	15	...	...	24	...	...
Totals ...	166	4	2·3	183	10	5·1	349	14	3·8

HAM GREEN HOSPITAL.

TABLE V.

The Stage of the Disease when Patients were admitted to Hospital.

Disease.	DAYS OF 1ST WEEK.							WEEK OF ILLNESS.				
	1	2	3	4	5	6	7	1st	2nd	3rd	4th & over.	Total.
Scarlet Fever	—	33	93	115	76	25	14	356	30	24	4	**414**
Diphtheria	—	7	35	70	69	44	21	246	28	2	1	**277**
Enteric Fever	—	—	—	—	—	—	1	1	5	1	—	**7***

* Excluding one "carrier" case.

TABLE VI.

Complications observed in Patients discharged during 1909.

Scarlet Fever.

	Otorrhœa.	Rhinorrhœa	Albuminuria	Cervical Adenitis.	Bronchitis.	Nephritis.	Pneumonia.	Arthritis.	Cervical Abscess.	Carditis.	Relapse.	Mastoid Abscess.	Onychia.	Cellulitis.
In 420 non-fatal cases ...	61	37	11	10	...	12	1	8	8	1	4	1	7	1
In 9 fatal cases ...	2	...	...	1	2	2	...	2	1	1	1	..	...	...
Total 429 cases	**63**	**37**	**11**	**11**	**2**	**14**	**1**	**10**	**9**	**2**	**5**	**1**	**7**	**1**
Percentage	14·6	8·6	2·5	2·5	0·4	3·2	0·2	2·3	2·0	0·4	1·1	0·2	1·6	0·2

Diphtheria.

	Paralysis.	Vomiting.	Otorrhœa.	Cervical Adenitis.	Epistaxis.	Pneumonia.	Cellulitis.	Relapse.	Nephritis.	Cervical Abscess.
In 272 non-fatal cases	38	1	18	7	1	1	2	2	3	4
In 14 fatal cases ...	3	4	1	6	2	2	4	...	1	...
Total 286 cases ...	**41**	**5**	**19**	**13**	**3**	**3**	**6**	**2**	**4**	**4**
Percentage	14·3	1·7	6·6	4·5	1·0	1·0	2·0	0·6	1·3	1·3

HAM GREEN HOSPITAL.

Statistics for each Year since opening of Hospital.

TABLE VII.

Admissions Classified according to DISEASE.

YEAR.	Scarlet Fever.	Diphtheria.	Enteric Fever.	Mixed Infections.	Other Diseases and Quarantine.	TOTAL.
1899 (From July 24th)	194	4	21	...	7	226
1900	571	70	38	..	...	679
1901	452	27	44	...	4	527
1902	536	128	42	21	...	727
1903	370	323	11	11	...	715
1904	374	317	26	2	...	719
1905	476	310	...	19	12	817
1906	439	342	8	9	19	817
1907	370	445	...	43	31	889
1908	219	513	13	11	21	777
1909	414	359	8	23	49	853
Totals	4,415	2,838	211	139	143	7,746

Discharges and Deaths.

YEAR.	Scarlet Fever.		Diphtheria.		Enteric Fever.		Mixed Infections and other Diseases.	
	Discharges.	Deaths.	Discharges.	Deaths.	Discharges.	Deaths.	Discharges.	Deaths.
1899 (From July 24)	127	5	3	...	3	...	5	...
1900	485	15	50	12	33	1	...	...
1901	452	10	34	1	39	5	...	..
1902	540	11	67	14	33	4	18	2
1903	377	4	308	17	17	2	12	...
1904	326	7	310	20	24	2	2	...
1905	426	16	271	13	...	...	25	5
1906	433	12	314	20	3	1	28	2
1907	405	15	387	34	4	...	58	1
1908	197	4	516	28	11	...	41	3
1909	420	9	359	14	6	...	63	5
Totals	4,188	108	2,619	173	173	15	252	18
Average Fatality per cent.	2·5		6·1		7·9		6·6	

NOVERS HILL HOSPITAL.

Report of the Medical Attendant for the Year 1909.

Small-pox.

Remaining from 1908	1	45
Admitted	44	
Discharged	39	45
Died	6	
Remaining	0	

The types of the disease were as follows :—

4	Cases	were	Hæmorrhagic.
8	,,	,,	Confluent.
10	,,	,,	Discrete.
9	,,	,,	Modified or Abortive.
3	,,	,,	proved to be Chicken-pox.
1	,,	,,	remaining from 1908 was Discrete.

The remaining 10 had been exposed to infection or showed suspicious symptoms and were admitted for observation and isolation, or to allow of proper disinfection of the premises.

Of the cases that died, four were Hæmorrhagic. One of these, age 45, was stated to have been vaccinated in infancy, but had no marks—in Hospital three days. Another was a child, age eight, unvaccinated—in Hospital one day. Another, a man age 41, vaccinated in infancy, three marks—in Hospital five days. Another, age 10, primarily vaccinated five days before admission and four days before the appearance of eruption—in Hospital ten days.

Two Confluent, one woman age 29, vaccinated in infancy, one indistinct mark—in Hospital ten days ; the other a man, age 42, vaccinated in infancy, two indistinct marks—in Hospital six days.

Of the fatal cases it will be noticed that two cases were not vaccinated at all—one stated to have been but showed no marks and three, all adults, were only vaccinated in infancy.

In the *Confluent* cases of which there were eight including two that died, the ages varied from 24 to 53. They had all been vaccinated in infancy, more or less indifferently, but none had been re-vaccinated, with one exception where re-vaccination was stated to have been done 20 or 30 years previously, but there was no evidence of this having been done. Average duration in Hospital 52 days.

Discrete.—Ten cases—one age 26 was unvaccinated—one age 11 was only vaccinated six days before admission, infection of Small-pox therefore received before vaccination. The rest were all vaccinated in infancy but were not re-vaccinated — excluding the two unvaccinated cases the ages vary from 26 to 47. Average duration in Hospital 41 days.

Modified Cases.—One age 11, unvaccinated, was vaccinated three days before admission, suspicious symptoms of Small-pox appearing, was sent to Hospital, Small-pox eruption appearing day after admission. Note this patient was an inmate in a house were Small-pox had broken out. The rest, whose ages varied from 5 to 23, were all vaccinated in infancy, but none re-vaccinated. Average duration in Hospital 18 days.

Of the remaining 13 cases, three proved to be Chicken-pox, and all the rest were admitted as a precaution, or for the purposes of securing disinfection.

There appears to have been rather a large number sent in not suffering from Small-pox, but judging from the very virulent type of the cases admitted, it is alarming to contemplate to what magnitude the epidemic would or

may have reached, had not these suspicious or contact cases been placed under observation and properly disinfected both in person and clothing.

I would call attention to the fact that the *only two* positively unvaccinated cases died, and further that all the modified or abortive cases were young adults. There are no special complications of the disease to record but this does not differ from my experience of Small-pox. Though one of the most loathsome of all diseases it is one of the last to leave complications and after troubles. I think I can safely say that every patient sent out of Hospital left it in better health than (before the attack) when they came in.

I must just refer to an interesting case of a baby aged eight months, admitted with its mother, who was suffering from Confluent Small-pox and suckling at the time. The baby was immediately vaccinated (primary), and although it was in the same ward as other patients the whole of the time when in Hospital—a period of 13 weeks—nursed, petted and played with by other convalescent patients, it never contracted the disease, a fact attributed to the efficacy of successful and timely vaccination, as it is well-known very young children are peculiarly predisposed to contract infection.

The baby became the ward pet and created quite a keen competition amongst the would-be nurses as to who should have the privilege. When admitted it was dirty and neglected but left looking the picture of health—clean and wholesome.

A second un-vaccinated infant, aged eight months, was also admitted with its mother who had a discrete attack, was at once vaccinated, and remained perfectly well in the ward with its mother until her discharge.

The nursing staff, under the efficient supervision of Miss Watt, some of whom were glad of the opportunity to gain more experience in nursing this interesting disease, gave general satisfaction.

SCARLET FEVER.

Admitted	31	
Discharged	16	31
Died	0	
Remaining	15	

Owing to the outbreak of Small-pox the Hospital was emptied of Scarlet Fever patients, and no cases of the latter disease were admitted until August 8th.

The average duration that patients were detained was eight weeks.

Compound diseases and complications were as follows :—

Double Pneumonia, one ; Albuminuria, three ; Rhinitis, two ; Rheumatism, two ; Nephritis, one ; Otitis, one ; Diphtheria and Scarlet Fever, one ; Secondary Rash, four.

G. C. PAULI, M.R.C.S., L.R.C.P.,
Medical Attendant.

CITY HOSPITALS—Comparative Statement of Expenditure.

	NOVERS HILL.		HAM GREEN.	
	Year ending 25th March, 1909	Year ending 25th March, 1910	Year ending 25th March, 1909	Year ending 25th March, 1910
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Salaries and Wages:—	50 0 0	50 0 0	50 0 0	50 0 0
Medical Superinteudent	200 0 0	200 0 0	258 0 0	258 0 0
Medical Officer	....	....	16 16 0	16 16 0
Special Services as *locum tenens*	83 0 0	83 0 0	108 0 0	108 0 0
Matron	701 15 5	659 8 4	2221 3 7	2320 16 4
Nurses, Officers, and Servants	1 9 6	1 9 9	3 17 0	....
Tithe Rent	207 10 9	220 12 6	425 4 7	449 19 11
Rates	10 10 0	10 10 0	41 0 0	41 0 0
Rent of Telephone	....	....	9 9 0	9 2 4
Rent of Cottage	1 12 6	19 13 5	7 1 3	74 5 4
Insurance Premiums	108 13 6	102 10 8	385 10 10	397 16 9
PROVISIONS, viz.: Meat	27 18 0	21 16 7	65 11 11	75 2 11
Fish and Ice	4 5 11	9 1 6	46 15 1	50 12 10
Poultry and Game	32 3 5	28 11 5	175 12 11	190 11 11
Bread and Flour	116 17 1	80 18 6	551 15 0	587 0 5
Milk, Butter and Eggs	70 17 11	67 19 2	284 13 9	328 12 7
Groceries	9 15 1	12 7 4	187 6 3	157 15 11
Vegetables and Fruit	1 2 0	....	9 12 6	15 19 0
Wine and Spirits	1 7 6	0 12 6	15 7 6	7 15 0
Mineral Waters	140 4 2	124 5 10	671 12 10	639 2 3
Coal and Firewood	24 7 6	21 0 0	212 5 0	243 3 6
Water, and Hire of Meter	54 3 3	48 1 10	....	....
Gas	7 8 3	168 1 11	36 18 3	59 19 1
Painters' Work	26 0 4	15 15 11	6 14 10	....
Plumbers' Work	82 5 2	29 8 9	36 11 10	43 1 8
Ironmongery, Fittings, and Repairs	....	....	37 14 0	40 8 6
Electrical Fittings, and Inspection of same	....	....	30 0 0	30 0 0
Maintenance of Battery	....	....	16 10 0	....
New Boiler	....	9 12 8	....	....
Repairing Fencing	54 13 3	40 17 4	167 8 11	156 18 3
Cleaning Materials and Baskets	....	....	9 17 6	6 0 2
Sweeping Chimneys	4 9 6	4 3 11	24 12 4	17 1 7
Crockery, Cutlery and Glass	30 6 2	19 6 5	8 10 0	28 1 6
Mould, Seed, Plants and Manure, etc.	6 7 11	....	....	....
Weed Killer	....	4 12 0	....	....
Garden Frame	42 2 0	26 8 5	96 0 8	73 15 8
Linen, Drapery, and Uniform Clothing	20 17 11	23 5 8	221 18 0	227 5 5
Drugs and Chemicals	....	48 19 5	18 19 6	....
Repairs to Roadway	....	....	9 10 0	3 10 0
Removing Bodies	30 9 9	11 3 8	40 12 6	8 12 0
Furniture, Fittings, and Bedding	....	....	71 11 4	13 10 4
Mackintosh Sheeting	31 12 3	16 5 1	63 1 0	70 19 3
Printing, Stationery, and Advertising	4 7 9	4 5 11	7 18 1	10 7 2
Papers, Periodicals, and Books	8 3 8	6 3 10	17 17 4	23 7 8
Postage and Contract Stamps	13 8 8	9 4 4	92 15 3	97 18 0
Hauling and Cab Hire	....	....	6 2 2	7 10 5
Toys	....	....	....	6 0 6
Carriage of Goods, and Bridge Tolls	....	....	13 0 7	4 12 11
Railway and Tram Fares	9 9 0	....	2 2 0	6 6 0
Medical Consultations	....	3 5 0	....	....
Doors for Meter House	....	3 16 8	....	6 19 3
Croquet Set, Swings, etc.	3 9 4	3 9 4	9 8 7	9 8 7
Contribution to Workmen's Compensation Fund	....	....	....	15 17 0
Weighbridge Office	....	....	....	12 0 0
Shed for Forge	....	8 9 0	....	....
Expenses to London re Extension of Hospital	....	....	....	8 17 6
Pigs	....	....	....	3 15 0
Fowls	....	....	....	15 10 0
Pigsties	....	....	....	7 19 8
Food, etc., for Pigs and Fowls	9 19 7	5 3 9	16 9 11	6 8 2
Petty Disbursements				
TOTAL EXPENDITURE IN THE YEAR	£2233 4 0	£2223 18 4	£6808 19 7	£7043 14 3
		J. CROMPTON, F.S.A.A., City Accountant.		
Number of Patients in the year	94	66	947	961
Total Cost per week for each Patient, including all the Working Expenses	s. d. 32 8½	s. d. 112 3¾	s. d. 24 3	s. d. 22 3¾

PART IV.

REPORT OF THE CHIEF INSPECTOR OF NUISANCES.

PUBLIC HEALTH DEPARTMENT,
40 PRINCE STREET,
February, 1910.

1909.

TO THE CHAIRMAN AND MEMBERS OF THE HEALTH COMMITTEE.

GENTLEMEN,

I have onee again the honour of submitting the following brief report, with summaries, showing the amount of work effeeted in this Department during the year 1909.

The complaints and applieations received at the Offiee numbered 919, as against 1,101 in the previous year, a deerease of 182, all of whieh were duly enquired into as quickly as possible, and wherever a nuisanee was found, steps were at onee taken for its abatement, but in 299 of the eases so complained of, no nuisanee was found, so that no action was neeessary ; this works out at 32·5 per eent. of the whole, last year sueh eases were 24·3 of the whole. A considerable number of the applications were from persons changing residenee who wished to have some guarantee that the house they were going to was in a good sanitary condition, and in this way considerable amount of good sanitary work has been aeeomplished, as people will not take a house when the drains, &e., are known to be defeetive, and the owners prefer doing whatever is neeessary to losing the prospeet of a tenant.

1,746 cases of notifiable infectious disease were duly enquired into by the District Inspectors and the results entered on the case cards as required by the Medical Officer of Health. Last year such cases numbered 1,759, a decrease of 17: these cases required 5,041 visits to the infected houses; many of such cases, being nursed at home, require frequent visiting; and when children attend any of the Elementary Schools, cards are made out by the Inspectors and sent to the Head Master or Mistress of the School as well as to the School Medical Officer of the Education Committee, all of which entails a considerable amount of clerical work, three cards being required for each case.

1,726 infected houses were disinfected after such cases and 44,508 articles of bedding, clothing, &c., removed therefrom, disinfected by steam and returned in the houses. 778 similar articles were destroyed, their condition being such that disinfection was impossible.

The clothing of all Patients removed to Ham Green and Novers Hill Hospitals is not included in the above totals, but is disinfected at those Hospitals, which are both equipped with a Washington Lyons Steam Disinfector.

Non-Notifiable Infectious Diseases, such as Measles, Whooping-Cough, Chicken Pox, Mumps, &c., were also visited on receipt of notification from the Elementary Schools that children from certain houses were absent from school in consequence of such disease, 1,853 visits were paid to such houses and leaflets of precautions necessary in such cases, given to the parents, and in acute cases the parents were advised to secure proper medical attendance, and often did so. Disinfection is also offered and carried out wherever considered advisable, or of any practical use.

Small Pox.

This disease was prevalent during the first five months of the year, and although the actual number of cases was small compared with many previous outbreaks, the number of contacts with such cases was so large, and were scattered over such a wide area, that it was necessary to detail several Inspectors to visit them daily during the period of incubation, and in this way 16,398 visits were paid, and I regret to say that Inspector Slade, who was one of those so employed, which meant being out early and late in all weathers, Sundays as well as week-days, contracted a severe attack of Pneumonia and Pleurisy with considerable effusion, which laid him up for 15 weeks, and landed him with a very heavy doctor's bill besides a considerable financial loss through stoppage of wages.

Phthisis.

Phthisis has again caused a considerable amount of work, 568 cases having been notified, viz., 395 Voluntary and 173 Poor-law Notifications; these latter are under the Public Health (Tuberculosis) Regulations, 1908, which came into operation on January 1st, 1909, and as I hinted last year has largely increased the work of visiting and disinfection. In all cases the homes in which patients have been living are sprayed with a strong solution of formalin immediately after the patient has been removed therefrom, either by death or for any purpose whatever, and as I have previously stated they very frequently remove from one house to another. There were 391 deaths from this terrible disease during the year, a decrease of seven from the previous year. There are now over 1,000 cases of this disease under observation in this City.

Notices to Abate Nuisances.

1,566 informal or preliminary written notices were served and were so successful that only 389 Statutory Notices were required, of which a considerable number

were in connection with party or combined drains, all of which were complied with except one and in this case the owner was summoned before the Justices and was ordered to do the work within a specified time and to pay all the costs, a penalty was not asked for. I also had to apply to the Justices for a compulsory order of admission to a house for the purpose of opening drains for examination under Section 41, Public Health Act, 1875, which, on such examination being afterwards made, were found to be so defective that entire reconstruction was necessary and the owner then caused the work to be done very speedily. This was the first time in 37 years that I have had occasion to apply for such an Order.

In addition to the written notices a considerable number of verbal requests were made to property owners with satisfactory results. I have also personally written 1,071 letters and a large number of post cards during the year.

The usual Summary of Work effected by the District and Special Inspectors is appended.

Drain testing has, as usual, occupied a considerable portion of the Inspectors' time, the smoke test having been applied 1,388 times, in addition to a large number of chemical and water tests.

Houses Let in Lodgings or Tenement Houses.

These are about the same number as last year, but are gradually diminishing from various causes, although many others are waiting for registration, and will be so registered as soon as the necessary inspectorial assistance is forthcoming, which, I trust, will not be much longer delayed. As I have before stated many times, the work of registering and supervising such houses is very important, especially in the prevention of overcrowding and its attendant evils. 260 May notices for Limewashing and Cleansing such houses were served in accordance

with the Bye-Laws, and were all complied with ; 1,352 rooms and 294 passages and stairs in these houses were thus Limewashed and Cleansed.

Combined or Party Drains.

Sixteen such drains, to which the drains of 141 houses were connected, have been relaid during the past year, and the cost thereof apportioned amongst the various owners. The Bristol Corporation Act of 1905 renders this a comparatively easy matter to what it formerly was, as it makes the definition of " Private Drain " very clear, and does away with the old-time controversy of drains and sewers.

Slaughter Houses

Now number 104, being three less than last year ; of the three which have been closed, two were of the old worn out permanent patterns and one with an annual License only. There are now 63 private Slaughter Houses with permanent Licenses, 38 private Slaughter Houses with annual Licenses, one for foreign animals at Avonmouth, and two Knackers Yards. Total 104.

Your Committee's two Inspectors of Meat, Fish, &c. Messrs. Thomas and Gitsham have, as usual, been most energetic in the execution of their duties, and have been responsible for the destruction of 36 tons, 9 cwt., and 20 lbs. of meat of various kinds, which were unfit for human food, all of which was voluntarily surrendered to them for destruction, and consisted of :—

The entire carcases of	24	Beasts.
,, ,,	42	Sheep.
,, ,,	100	Pigs.
,, ,,	8	Calves.

The remainder consisted of parts of carcases and odd pieces of meat.

There were also destroyed for the same reason 63 rabbits, 602 packages of fish (not weighed), 803 packages of vegetables of various kinds, 125 packages of fruit of various kinds and a quantity of yeast, all being voluntarily surrendered so that no prosecutions were necessary.

I regret that the question of Public Abattoirs is still in abeyance, and to all appearances will not be an accomplished fact during my tenure of office, although at one time I had great hopes of it, but as I have year after year persistently advocated the advent of these Abattoirs, I will not now repeat what I have so many times stated. I have pleasure in again bearing testimony to the genial and helpful manner in which the Bacon Curers and the great majority of the Butchers in this City meet your Inspectors, which naturally lightens their labours and renders their duties less unpleasant than they otherwise would be.

Housing of the Working Classes Act, 1890.

During the year just ended 17 houses have been dealt with under Section 32 of this Act, of these eight have been made habitable and nine finally closed as unfit for human habitation, without, in any case, appealing to the Justices for a closing order.

During the same time six courts and similar places with between 50 and 60 houses have been demolished to make room for the extension of business and other premises, many of which would have been dealt with under the Act, unless they had been so demolished.

The new Housing and Town Planning Act, 1909, is now an accomplished fact, and on going carefully through it I find some of its provisions to be far-reaching, and in particular, Sections 14 and 15, relating to an implied contract by landlords on letting a house or part of a house at £26 a year or under, that such house is in all respects

reasonably fit for human habitation, and that he will so maintain it throughout the tenancy, and in default thereof giving the Local Authority very drastic powers. This will, I trust, have the effect of materially improving the property now nearing the Slum-line as well as such that is already below it. I trust that good results will follow in its wake when its work has been fairly tried.

Factory and Workshop Act.

I am again pleased to report that the work in connection with this Act has again been carried on most amicably as between H.M. Inspectors and this department, which is largely due to the tact and energy displayed by Inspectors Griffiths and Wreford, who are specially detailed for this work. There are now 1,852 workshops registered, which is an increase of 112 from last year, but these vary considerably from time to time. The appended Summaries will show that 1,150 nuisances of various kinds have been found and abated during the year, and 5,947 visits were paid.

The houses of 884 out-workers were also visited at which 54 sanitary defects were found and the nuisance arising therefrom abated.

Forty-one intimations of sanitary defects of various kinds in Factories, &c., have been received from H.M. Inspectors, and 12 of protected persons sent to them, from this department.

The names and address of these out-workers consist very largely of the same persons from year to year. On receipt of fresh lists they are compared with the previous ones, and any new names and addresses are chosen for a visit before any of the old ones are re-visited.

Offensive Trades

Have, as usual, received considerable attention, and 47 nuisances of various kinds found to exist on these

premises have been abated, and in several instances suggestions made by your officers in a friendly way have been adopted by the owners with satisfactory results.

Smoke Abatement.

220 observations have been taken during the year, resulting in the abatement of 30 nuisances from the emission of black smoke, and this has been done chiefly by moral persuasion. Several large firms have, at considerable cost, readily adopted smoke abatement appliances as suggested by your officers: the service of a Statutory Notice might have been considered as officious interference and somewhat resented by the firms in question, whereas the adoption of these friendly suggestions has resulted in a considerable financial gain, owing to the saving of fuel, and thus the visits of your officers are not considered to be officious.

Careless and inefficient stokers are, however, still too frequently met with, and are responsible for much of the dense black smoke emitted from factory chimneys.

Dairies, Cowsheds and Milkshops.

There are now 82 Dairy Farms within the City boundaries (one more than last year), with some 112 cowsheds having accommodation for about 900 cows. These farms are scattered all round the fringe of the City of over 17,000 acres or 27 square miles, it will thus be seen what a difficult task your Dairy Inspector, Mr. Casely, has to keep them under continual observation, but I again bear testimony to the tact and ability he has ever displayed in carrying out his duties in connection with those farms, and to the great improvements effected, particularly in the methods of lighting, ventilation, paving, and water supply, a pure and plentiful supply of water being the first essential in dairy cleanliness.

At present there are no legal powers existing to enable your officers to visit or inspect the 300 farms outside the City, from which Bristol gets a large proportion of its milk supply.

The Milk Shops and Dairies registered within the City number over 1,000, and are kept under constant supervision, the large and best class Dairies give very little trouble, and any reasonable suggestions made by your Inspector are readily carried out, and I can and do affirm that several of those large Dairies compare very favourably with any to be found in the country ; but the small shops, where milk is kept for sale as well as other articles, frequently give a considerable amount of trouble, and I once again repeat what I have on many previous occasions stated, that milk should only be sold in shops confined to the sale of nothing but Dairy produce.

	DAIRIES.		COWSHEDS.		MILKSHOPS.		
	Number Inspctd	Defects Found	Number Inspctd	Defects Found	Number Inspctd	Defects Found	Discon-tinued
1890	90	22	35	19	455	135	100
1891	258	140	36	13	660	332	115
	No. on Register		No. of Inspctns.				
1892	1053	85	1173	33	752	200	108
1893	1019	82	1069	45	732	79	126
1894	1203	89	1089	41	677	100	56
1895	1244	71	1587	31	720	74	53
1896	1271	60	2426	39	751	76	62
1897*	1273	62	2063	55	785	35	50
1898	1300	61	2466	19	775	60	65
1899	1400	61	2499	33	787	40	73
1900	1370	23	2347	30	772	20	78
1901	1300	22	2184	33	664	67	120
1902	1300	23	2620	31	668	55	100
1903	1200	23	2049	39	609	49	93
1904†	1015	62	2340	36	543	55	100
1905	1000	83	2453	37	476	57	39
1906	1000	26	2340	38	476	57	97
1907	1020	51	2379	40	451	56	47
1908	1038	25	1875	13	412	47	20
1909	902	19	1114	12	198	22	27

*City enlarged in November, 1897.

†City enlarged in October, 1904.

Common Lodging Houses.

The accommodation in private Common Lodging Houses is now as follows, viz.:—

Single Men	.. ..	1,573 persons.
Single Women	..	27 ,,
Married Couples 27	..	54 ,,

These houses are 44 in number, with 230 rooms. The Bye Laws relative thereto have again been so well observed that no legal proceedings have been necessary, whilst many improvements in the shape of improved Sanitary conveniences have been effected during the past year under the provisions of the Public Health Acts Improvement Act, 1907. The Bye Laws relative to Limewashing and General Cleansing are at all times rigidly enforced.

The Municipal Lodging House with cubicles for 120 men is becoming more appreciated than it was, which is not to be wondered at, as there are up-to-date laundry applianees and foot baths free, and a full bath can be had for a penny.

The Salvation and Church Army Shelters also provide accommodation for about 250 others. A Summary of work done at these houses is appended.

In concluding my report I feel that I must express my gratitude to the Health Committee for the support always given me in the discharge of my duties. To the Medical Officer of Health, Dr. Davies, for invaluable advice and assistance, always so courteously and kindly given. I also desire to express my appreciation of the manner in which the Staff of Inspectors discharge their duties, they work together like a machine, for the betterment of the sanitary conditions of the City and the health of the citizens ; but I regret very much to say that in addition to the case of illness already alluded to in regard to Small Pox enquiries, another of the Inspectors was

laid up eight weeks with Typhoid Fever, which may, or may not, have been contracted in the execution of his duties, and yet another had to undergo a painful operation in Hospital, the result of a fall whilst on duty a few years ago but which was not thought much of at the time.

My thanks are again due and are hereby gratefully tendered to the Town Clerk and his assistants, and to the City Engineer and his Staff for much valuable advice and assistance.

I am Gentlemen,

Your obedient Servant,

JAMES W. KIRLEY,

Chief Inspector of Nuisances

Summary of Work effected in the Health Department during Twelve Years—1898-1909.

Prepared by the Chief Inspector of Nuisances.

TABLE SHOWING THE NUMBER OF NUISANCES ABATED AND OTHER WORK DONE IN EACH YEAR SINCE 1898.

	1898*	1899	1900	1901	1902	1903	1904†	1905	1906	1907	1908	1909
Number of Nuisances abated	12118	11837	10920	10151	10482	10542	11007	12232	10313	10369	9657	9360
Polluted Wells closed	46	49	18	19	21	11	8	22	15	8	3	3
Houses supplied with Co.'s Water ...	151	150	78	83	65	47	51	91	50	44	33	34
Houses disinfected ...	682	951	2216	2652	3130	2866	2229	1950	2070	2057	1759	1726
Articles of bedding, &c., disinfected or destroyed	25852	29965	55807	66626	68330	63919	52813	53488	51026	46137	39841	45286

*Enlarged City. †Enlarged City.

Summary of Nuisances Abated and Work done by, and under the Supervision of the Inspectors in the Health Department during the Year ending December 31st, 1909.

Prepared by the Chief Inspector of Nuisances.

NATURE OF WORK.	By District Inspectors.	By Inspector of Dairies, &c.	By Inspectors of Workshops &c.	By Inspectors of Slaughter Houses, &c.	By Inspector of Common Lodging Houses.	By Inspector of Bake Houses.	Totals.
Visits and Re-visits	28471	2224	5947	17978	571	1109	56300
Drains entirely relaid, &c.	250	4	26	3		2	285
Do. partially relaid	545	10	30	5	2	2	594
W.C.'s fitted with new pans, &c. ...	618	5	67	8	20	7	725
Do. cleansed and amended	202	11	114				327
Do. fitted with flushing appliances ...	200	7	60	5	20	7	299
Additional W.C. accommodation provided	19		17				36
Dilapidated Houses repaired, &c. ..	435						435
Defective Roofs repaired	263		26		3	13	305
Sinks and Yard Gullies trapped ...	1125	19	46	10		2	1202
Yards paved by Owners	645	39	63	6			753
Cesspools abolished	10						10
Offensive Deposits removed	178	130	9	20		5	342
Keeping of Pigs, &c., prohibited ...	86						86
Smoke Nuisances abated	30		4				34
Offensive Trades do.	47						47
Polluted Wells closed	3						3
Company's Water provided to houses ..	27	7	4				38
Nuisances from overcrowding abated ..	42		2				44
Dairies, &c., Cleansed and Improved ...		43					43
Workrooms and Passages, limewashed, &c.			619				619
Do. better ventilation secured			53				53
Rooms at Tenement Houses limewashed, &c.	1352						1352
Passages and Stairs at do. do.	294						294
Slaughter Houses limewashed				410			410
Do. Paving repaired ...				9			9
Limewashing, &c., secured		415			82	170	667
Other Nuisances abated	205	48	14	5	37	43	352
Totals	**6576**	**738**	**1154**	**481**	**164**	**251**	**9364**

No. of Complaints received and attended to 919
,, Offensive trades visited 145
,, Smoke observations taken 220
,, Times smoke test applied to drains 1388
,, Notices served informal 1566
,, ,, ,, formal 389
Half-yearly Cleansing Notices served, Common Lodging Houses 83
,, ,, ,, ,, Dairies, Cowsheds, &c. ... 424
,, ,, ,, ,, Slaughter Houses ... 294
,, ,, ,, ,, Tenement Houses ... 260
,, ,, ,, ,, Bakehouses... 213
No. of Visits to houses *re* infectious disease 5041
,, Houses disinfected after such disease 1726
,, Articles of Bedding, &c., removed and disinfected ... 44508
,, Do. Do. and burnt 778
Total number of Articles dealt with 45286
Weight of Meat destroyed as unfit for food 36 tons 9 cwt. 0 qr. 20 lbs.
No. of Visits to Small-pox contacts 16398

JAMES W. KIRLEY,
Chief Inspector of Nuisances.

City of Bristol.

FACTORY AND WORKSHOP ACT, 1901.

REPORT OF THE MEDICAL OFFICER OF HEALTH ON THE ADMINISTRATION OF THE ACT IN THE CITY OF BRISTOL DURING THE YEAR 1909 (Sec. 132, F. & W. Act, 1901).

Workshops.

The Factory and Workshop Act (1891) transferred the Sanitary control of "Workshops" and "Workplaces" from the Inspector of Factories to the City Council acting as the Urban Sanitary Authority.

A special Inspector of Workshops was appointed, Workshops were at once placed on the Register and inspected, and this control has been continuously exercised since its commencement up to the present. Upon the extension of the City in 1897, a second special Inspector of Workshops was appointed. The progress of the work year by year, is shown in the following table :—

TABLE 1. **Workshops.** CITY OF BRISTOL.

Showing particulars in regard to the Inspection of Workshops since 1891.

Year.	Population of City.	No. of Workshops on Register.	No. of Nuisances abated.	Visits & Revisits.	Particulars sent to H.M. Inspector.	Communications received from H.M. Inspector.
1892	223,592	134	215	970	—	5
1893	225,028	349	568	2377	303	15
1894	226,578	584	644	2188	128	18
1895	228,139	764	558	1978	29	32
1896	230,623	881	578	2456	10	35
1897	232,242	1042	660	2674	14	19
CITY ENLARGED.						
1898	316,900	1123	1203	4943	16	21
1899	320,911	1602	1117	4494	37	16
1900	324,973	1800	1004	4263	13	15
1901	329,086	1846	1005	4875	12	25
1902	334,632	1872	1187	5480	21	62
1903	338,895	1532	1110	5885	39	71
1904	343,204	1537	1237	5563	45	88
CITY ENLARGED.						
1905	358,515	1611	1366	4973	25	52
1906	363,223	1652	1058	5141	14	37
1907	367,979	1611	1305	5224	36	63
1908	372,785	1740	1306	5595	19	50
1909	377,642	1852	1150	5947	12	41

The details of work secured during the year 1909 are shown in the following table:—

TABLE 2. **Workshops.** CITY OF BRISTOL.

Work secured by the Special Inspectors of Workshops, etc., in the City of Bristol, during the year 1909.

Total Visits and Re-visits	5947
Total Nuisances abated	1150

PARTICULARS OF NUISANCES DEALT WITH.

DRAINAGE AND FILTH NUISANCES.	Drains entirely relaid	26
	Drains partially relaid	30
	W.C.'s fitted with new pans	67
	W.C.'s cleansed and amended ...	114
	W.C.'s fitted with flushing appliances	60
	Additional W.C. accommodation provided	17
	Sinks and Yard Gullies trapped ...	46
	Offensive Deposits removed	9
STRUCTURAL DEFECTS.	Defective Roofs repaired	26
	Yards paved by Owners	63
LIMEWASHING AND CLEANSING.	Workrooms and Passages, limewashed and cleansed	619
VENTILATION AND OVERCROWDING.	Nuisances from overcrowding abated	2
	Better Ventilation secured in Workrooms	53
WATER SUPPLY.	Company's Water provided	4
	Other Nuisances	18

Home Work.

(SECS. 107 TO 115)

The following table shows particulars with regard to the lists of Outworkers received during the year 1909. The lists are kept by the Town Clerk, who forwards to the Medical Officer of Health the names and addresses of those Outworkers who reside within the District of the City of Bristol

TABLE 3. **Workshops.** CITY OF BRISTOL.

OUTWORKERS.

Showing Lists received during the year 1909.

Nature of Employment.	February Lists.		August Lists.	
	No. of Lists.	No. of Outworkers.	No. of Lists.	No. of Outworkers.
Boot and Shoe Making	13	164	7	83
Cabinet Making, etc.	1	7	1	3
Manufacture of Wearing Apparel	42	1186	28	1189
Other Trades ...	5	64	3	8
	61	1421	39	1283

Upon receipt of the lists of Outworkers the Workshop Inspectors visit the premises as far as possible in conjunction with their work under the other provisions of the Act. The number of premises visited in 1909 was 784, and 54 sanitary defects were found to exist, which were rectified ; in no instance was any case found where wearing apparel was being made, cleaned, or repaired in a house, whilst any inmate was suffering from Scarlet

Fever or Small Pox (see Sec. 109). Nor did any ease require aetion to be taken under Section 110, for the reason that all sueh eonditions as are specified in Seetions 109 and 110, have, sinee the adoption of the Notifieation Aet in 1890, been most earefully guarded against by a eomplete system of administering the Notification and Public Health Aets, in whieh these questions have always reeeived speeial attention.

Factory and Workshop Act, 1901.

Inspection of Bakehouses for the year 1909.

REPORT OF THE INSPECTOR IN RESPECT OF WORK DONE UNDER THE PROVISIONS OF THE ABOVE ACT, WITH PARTICULARS OF THE CONDITIONS FOUND.

The number of Bakehouses in operation at some period of the year was 340, which was a slight increase above 1908.

The general sanitary condition of these places has improved as a whole. Four drainage defects required attention as compared with ten in the year before, and five other general nuisances had to be dealt with, compared with fifteen in 1908.

Three Under-ground Bakehouses have gone out of use (it is to be hoped permanently). The total number of Under-ground Bakehouses in use at the passing of the Factory and Workshops Act, 1901, was 52, of which 23 have been closed under the provisions of the Act, or gone out of use. Total at present in use 29.

Compliance with the Limewashing Regulations, however, was not so well observed, and it was necessary to require that this work should be done in 170 cases, which was an increase of 30 over 1908.

Better cleaning of floors, fittings and utensils was called for in 43 cases, being an increase of 19.

Probably the inclement weather experienced last year accounted for some of these lapses.

Improved conditions in manufacture by the installation of improved appliances has been noted in various places.

I am Gentlemen,
Yours obediently,
S. O. DIMOND,
Inspector of Bakehouses.

Workshops. TABLE 4. CITY OF BRISTOL.

BAKEHOUSES.

Showing defects found and remedied in each year since bakehouse inspection was instituted.

Year.	Particulars.	Total.
1884	Total contraventions found in respect of cleansing, lime-washing, defective drains, repairs, and defective ventilation.	342
1885	Ditto	244
1886	Ditto	96
1887	Ditto	132
1888	Ditto	69
1889	Ditto	65
1890	Ditto	89
1891	Ditto	80
1892	Ditto	71
1893	Ditto	36
1894	Ditto	57
1895	Ditto	74
1896	Ditto	57
1897	CITY ENLARGED IN 1897.	140
1898	Ditto	178
1899	Ditto	168
1900	Ditto	172
1901	Ditto	151
1902	Ditto	198
1903	Ditto	192
1904	CITY ENLARGED Including special work required in underground bakehouses.	250
1905	Ditto	230
1906	Ditto	232
1907	Ditto	281
1908	Ditto	205
1909	Ditto	246

TABLE 5. **Table of Bakehouse Inspection for the Year.**

1909. With particulars of Condition, Contraventions, Action taken, and Results.

Total number of inspections and visits	...	1109
Number of Bakehouse premises found to be in good or passable order and condition	878	
Ditto ditto not in satisfactory condition from one of the undermentioned defects	231	
	1109	1109

PARTICULARS OF DEFECTS AND CONTRAVENTIONS.

Total Defects.	Nature of Defects, etc., and Improvements secured.		Total Notices	Description of Notices Complied With.	
246	Contraventions of lime-washing regulations	170	231	Informal Notices given to abate nuisances, effect repairs, or comply with Regulations	186
	Ditto General cleaning	43			
	Bakehouse premises with defective drainage	4			
	Ditto with defective floors, roofs, paving, or other dilapidations ...	13		Various Written Notices served and complied with, or under way at end of the year ...	45
	Ditto Manure accumulations and other Nuisances	5			
	Waterclosets reconstructed and Flushed ...	7			
	Traps put in (Intercepting)	2			
	W.C. removed	1			
	Insufficient W.C. accommodation ...	1			
246		246	231		231

S. O. DIMOND, *Inspector.*

FACTORY ACT. HOME OFFICE FORM.

Annual Report of the Medical Officer of Health for the year 1909, for the City of Bristol.

on the administration of the Factory and Workshop Act 1901, in connection with

FACTORIES, WORKSHOPS, WORKPLACES AND HOMEWORK.

I.—INSPECTION OF FACTORIES, WORKSHOPS AND WORKPLACES.

Including Inspections made by Sanitary Inspectors or Inspectors of Nuisances.

Premises. (1)	Number of		
	Inspections (2)	Notices Written (3)	Prosecutions (4)
FACTORIES .. .. .. (Including Factory Laundries)	1180	432	None.
WORKSHOPS .. .. .. (Including Workshop Laundries)	3207		None.
WORKPLACES .. .. .. (Other than Outworkers' premises included in Part 3 of this Report)	1560		None.
TOTAL ..	5947	432	None.

2.—DEFECTS FOUND FACTORIES, WORKSHOPS AND WORKPLACES.

Particulars.	Number of Defects			Number of Prosecutions
	Found	Remedied	Referred to H.M. Inspector	
(1)	(2)	(3)	(4)	(5)
*Nuisances under the Public Health Acts :—				
Want of cleanliness	619	619		
Want of ventilation	53	53		
Overcrowding	2	2		
Want of drainage of floors	None	None		
Other nuisances	200	200		
†Sanitary Accommodation :—				
Insufficient	17	17		
Unsuitable or defective ..	241	241		
Not separate for sexes ..	3	3		
Offences under the Factory and Workshop Act :—				
Illegal occupation of underground bakehouse (S. 101)	None	None	Re-employment of young persons 12	None
Breach of special sanitary requirements for bakehouses (SS. 97 to 100) ..	None	None		
Other offences .. .. (Excluding offences relating to outwork which are included in Part 3 of this Report)	15	15		
Total	1150	1150	12	None

* Including those specified in Sections 2, 3, 7 and 8, of the Factory and Workshop Act as remediable under the Public Health Acts.

† Sec. 22 of the Public Health Acts Amendment Act, 1890, is in force in the City, the Standard conforms to the Memorandum.

3.—HOME WORK.

*Nature of Work. (1)	†Lists.	†Outworkers.	
Outworkers' Lists (S. 107) :—		Twice in the year.	
	Twice in the year.	Contractors	Workmen
Lists received from Employers—	(2)	(3)	(4)
Wearing Apparel—Making, &c.	62	—	2291
Furniture and Upholstery	2	—	10
Stationery	0	—	0
	64	None.	2301
	Once in the year.	Once in the year.	
		Contractors	Workmen
	(5)	(6)	(7)
Wearing Apparel—Making, &c.	28	7	331
‡Numbers of Addresses of Outworkers received from other Councils (8)		1	
Numbers of Addresses of Outworkers forwarded to other Councils (9)		1285	
Notices served on occupiers as to keeping or sending lists (10)		73	
Prosecutions—			
Failing to keep or permit inspection of lists (11)		None.	
Failing to send lists (12)		None.	
Number of Inspections of Outworkers' premises (13)		784	
Outwork in unwholesome premises, Section 108 :—			
Instances (14)		None.	
Notices served (15)		None.	
Prosecutions (16)		None.	
Outwork in Infected Premises, Section 109, 110.			
Instances (17)		None.	
Orders made (S. 110) (18)		None.	
Prosecutions (Sections 109, 110) (19)		None.	

* If an occupier gives out work of more than one of the classes specified in column 1, and subdivides his list in such a way as to show the number of workers in each class of work, the list should be included among those in column 2 (or 5 as the case may be) against the principal class *only*, but the outworkers should be assigned in column 3 and 4 (or 6 and 7) into their respective classes. A footnote should be added to show that this has been done.

† The figures required in columns 2, 3 and 4 are the *total* number of lists received from employers who comply strictly with the statutory duty of sending *two* lists each year and of the entries of names of outworkers in those lists. The entries in column 2 must necessarily be *even* numbers, as there will be two lists for each employer—in some previous returns odd numbers have been inserted. The figures in columns 3 and 4 will usually be double of the number of such employers and (approximately) double of the number of individual outworkers whose names are given, since in the February and August lists of the same employer the same outworker's name will often be repeated.

‡ In view of the wide discrepancies found to exist between the totals in the two columns when the returns are added together, it is desired that care may be taken to give exact figures. Only those addresses should be counted which have actually been received from or forwarded to other Councils during the year covered by the report.

4.—REGISTERED WORKSHOPS.

Workshops on the Register (s. 131) at the end of the year. (1)	Number. (2)
Important classes of workshops, such as workshop bakehouses, may be enumerated here:—	
Workshops	1852
Workshop Bakehouses	340
Total number of workshops on Register ..	2192

5.—OTHER MATTERS.

Class. (1)		Number. (2)
Matters notified to H.M. Inspectors of Factories:—		
Failure to affix Abstract of the Factory and Workshop Act (S. 133)		12
Action taken in matters referred by H.M. Inspector as remediable under the Public Health Acts, but not under the Factory and Workshop Act (S. 5)	Notified by H.M Inspector	41
	Reports (of action taken) sent to H. M. Inspector	41
Other		None.
Underground Bakehouses (S. 101):—		
Certificates granted during the year ..		None.
In use at the end of the year—		
Underground	18	29
Partially underground	11	

NOTE.—The Factory and Workshop Act, 1901 (s. 132), requires the Medical Officer of Health in his Annual Report to the District Council to report specifically on the administration of that Act in workshops and workplaces, and to send a copy of his Annual Report, or so much of it as deals with this subject, to the Secretary of State (Home Office). If the Annual Report is presented otherwise than in print, it is unnecessary to include in the copy sent to the Home Office the portions which do not relate to factories, workshops, workplaces or homework. The duties of Local Authorities and the Medical Officer of Health under the Act of 1901 are detailed in the Home Office Memorandum of December, 1904. A further Memorandum, on the Home Work Provisions of the Factory Act, was issued to all District Councils and Medical Officers of Health in October, 1906.

D. S. DAVIES, M.D.,
Medical Officer of Health.

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